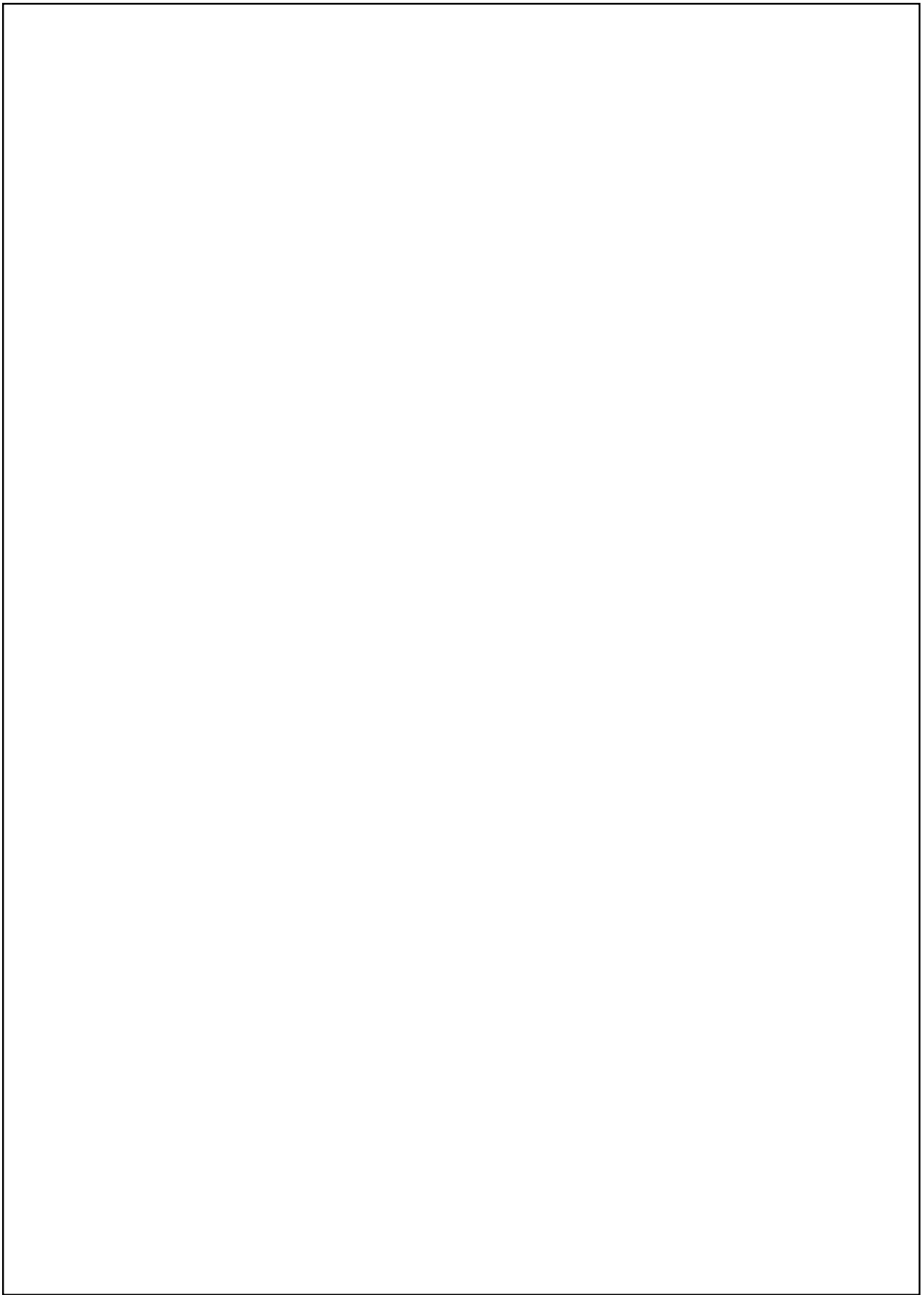


2003
SOUTH CAROLINA
AQUATIC PLANT MANAGEMENT
PLAN



Prepared by the
South Carolina Department of Natural Resources
and Approved by the
South Carolina Aquatic Plant Management Council

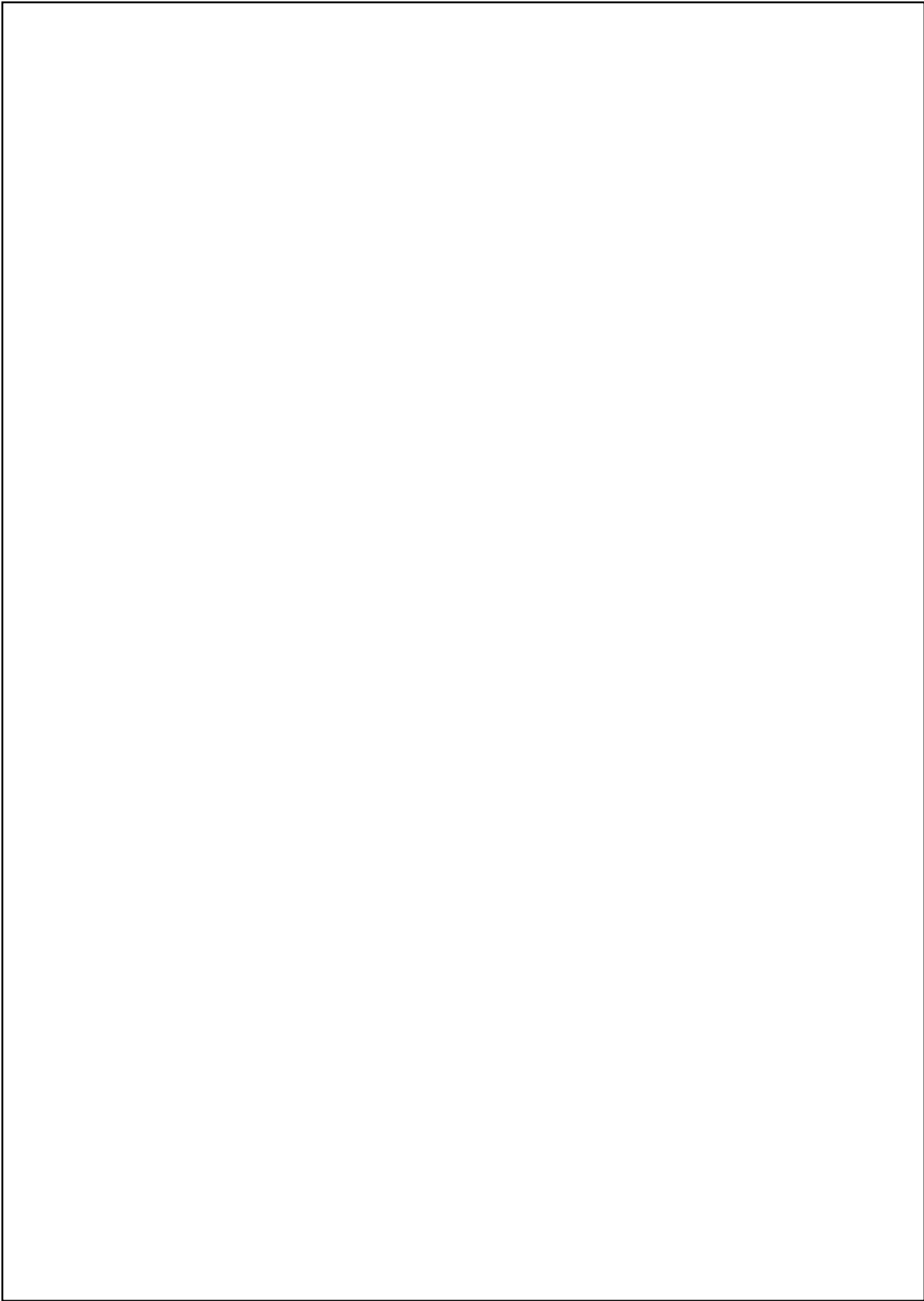
March 2003



2003

ANNUAL MANAGEMENT PLAN

PART II

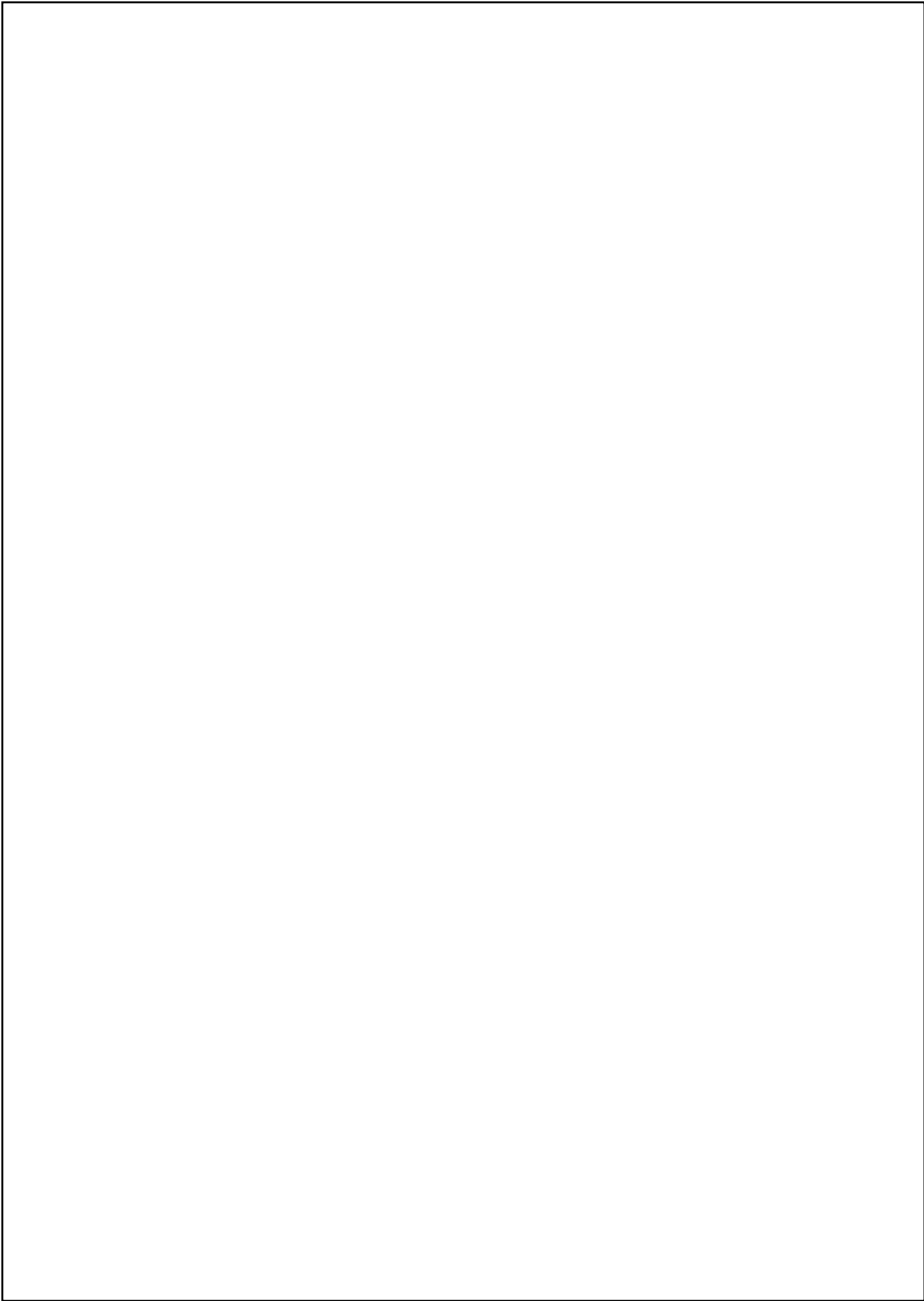


INTRODUCTION

The Annual Management Plan for 2003 was developed by application of the procedures described in the Aquatic Plant Management Plan, Part I (Procedural Management Plan). The phases of development of the Annual Management Plan include 1) identification of areas where aquatic plants interfere with water use, 2) development of a description of each problem area, 3) development of a management strategy for each problem area, and 4) determination of the distribution of available funding among problem areas.

Common and Scientific Names of Aquatic Plants Referenced in the Plan

Alligatorweed	<i>Alternanthera philoxeroides</i>
Bladderwort	<i>Utricularia</i> spp.
Brazilian elodea	<i>Egeria densa</i>
Cowlily	<i>Nuphar luteum macrophyllum</i>
Cattails	<i>Typha</i> spp.
Coontail	<i>Ceratophyllum demersum</i>
Creeping rush	<i>Juncus repens</i>
Curly-leaf pondweed	<i>Potamogeton crispus</i>
Duckweed	<i>Lemna</i> spp.
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Fanwort	<i>Cabomba caroliniana</i>
Filamentous algae	<i>Pithophora</i>
	<i>Lyngbya</i>
	<i>Hydrodictyon</i>
Floating bladderwort	<i>Utricularia inflata</i>
Floating heart	<i>Nymphoides</i> spp.
Giant cutgrass	<i>Zizaniopsis miliacea</i>
Hydrilla	<i>Hydrilla verticillata</i>
Musk-grass	<i>Chara</i>
Pondweed	<i>Potamogeton</i> spp.
Common reed	<i>Phragmites australis</i>
Slender naiad	<i>Najas minor</i>
Smartweed	<i>Polygonum densiflorum</i>
Southern naiad	<i>Najas guadalupensis</i>
Spikerush	<i>Eleocharis</i> spp.
Stonewort	<i>Nitella</i>
Variable-leaf pondweed	<i>Potamogeton diversifolius</i>
Waterlily	<i>Nymphaea odorata</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Water lettuce	<i>Pistia stratiotes</i>
Watermilfoil	<i>Myriophyllum</i> spp.
Water pennywort	<i>Hydrocotyle ranunculoides</i>
Water primrose	<i>Ludwigia hexapetala</i>
Watershield	<i>Brasenia schreberi</i>



AQUATIC PLANT PROBLEM AREAS

Areas where aquatic plants interfere with water use were identified from information provided by S.C. Aquatic Plant Management Council members, an aquatic plant survey conducted by the S.C. Department of Natural Resources staff and public input. The identified problem areas listed below are open to access and use by the public and are therefore considered by the Council as eligible for some type of public funding. Acres of infestation (coverage) are approximations based on observations made in 2002.

1. Water body - ***Ashepoo River***
Location - Colleton County
Surface acres - unknown
Aquatic plants - Water hyacinth
Coverage - 5 acres
Impaired activities - Boating, fishing, public access
2. Water body - ***Back River Reservoir***
Location - Berkeley County
Surface acres - 850
Aquatic plants - Brazilian elodea, hydrilla, water hyacinth, water primrose, fanwort
Coverage - 380 acres
Impaired activities- Boating, fishing, hunting, swimming, industrial water supply, municipal water supply, electric power generation, public access
3. Water body - ***Black Mingo Creek***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Alligatorweed, parrot feather
Coverage - 10 acres
Impaired activities - Boating, hunting, fishing, public access
4. Water body - ***Black River***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Alligatorweed
Coverage - 50 acres
Impaired activities - Boating, hunting, fishing, public access
5. Water body - ***Combahee River (Borrow pit)***
Location - Berkeley County
Surface acres - approx. 5 acres
Aquatic plants - Hydrilla, water primrose, water hyacinth
Coverage - 4 acres
Impaired activities - Boating, hunting, fishing, public access
6. Water body - ***Cooper River*** (and adjacent ricefields)
Location - Berkeley County
Surface acres - Unknown
Aquatic plants - Hydrilla, water primrose, water hyacinth
Coverage - approx. 2,000 acres
Impaired activities - Boating, hunting, fishing, public access

7. Water body - ***Goose Creek Reservoir***
Location - Berkeley County
Surface acres - 500
Aquatic plants - Water hyacinth, water lettuce, water primrose
Coverage - 80 acres
Impaired activities - Boating, public access, industrial water supply, floodway
8. Water body - ***Lake Greenwood***
Location - Laurens and Greenwood Counties
Surface acres - 11,400
Aquatic plants - Hydrilla, slender naiad, Filamentous algae (Pithophora, Hydrodictyon)
Coverage - 225 acres
Impaired activities - Boating, swimming, vector control, public access
9. Water body - ***Lake Keowee***
Location - Pickens and Oconee Counties
Surface acres - 18,300
Aquatic plants - Hydrilla
Coverage - 10 acres
Impaired activities - Potential impacts to water recreation, public access, electric power generation, municipal water supply
10. Water body - ***Lake Marion***
Location - Sumter, Clarendon, Calhoun, Berkeley, and Orangeburg Counties.
Surface acres - 110,000
Aquatic plants - Alligatorweed, Brazilian elodea, hydrilla, water primrose, slender naiad, coontail, water hyacinth, filamentous algae, fanwort, giant cutgrass
Coverage - 1000 acres
Impaired activities - Boating, swimming, public access, potential electric power generation, potential irrigation water withdrawals
11. Water body - ***Lake Moultrie***
Location - Berkeley County
Surface acres - 60,400
Aquatic plants - Alligatorweed, water primrose, Brazilian elodea, hydrilla, slender naiad, water hyacinth, watermilfoil, fanwort, giant cutgrass
Coverage - 50 acres
Impaired activities - Potential electric power generation, boating, swimming, public access, potential domestic and irrigation water withdrawals
12. Water body - ***Lake Murray***
Location - Lexington and Richland Counties
Surface acres - 50,000
Aquatic plants - Hydrilla, Illinois pondweed
Coverage - 2800 acres
Impaired activities - Boating, swimming, potential domestic and municipal water intakes, public access
13. Water body - ***Lake Wateree***
Location - Kershaw County
Surface acres - 13,710
Aquatic plants - Hydrilla
Coverage - < 2 acres
Impaired activities - Potential boating, swimming, public access

14. Water body - ***Little Pee Dee River***
Location - Marion and Horry Counties
Surface acres - Unknown
Aquatic plants - Alligatorweed
Coverage - 50 acres
Impaired activities - Boating, hunting, fishing, public access
15. Water body - ***Pee Dee River***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Water hyacinth
Coverage - 50 acres
Impaired activities - Boating, hunting
16. Water body - ***Santee Coastal Reserve***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 300+ acres
Impaired activities - Hunting, public access
17. Water body - ***Waccamaw River***
Location - Georgetown and Horry Counties
Surface acres - Unknown
Aquatic plants - Water hyacinth
Coverage - 125 acres
Impaired activities - Boating, hunting, fishing, public access
18. Water body - ***Charles Towne Landing State Park***
Location - Charleston County
Surface acres - 5
Aquatic plants - Duckweed, alligatorweed, pennywort
Coverage - 4 acres
Impaired activities - Fishing, aesthetics
19. Water body - ***Kings Mountain State Park - Crawford Lake***
Location - York County
Surface acres - 9
Aquatic plants - Slender naiad
Coverage - 4 acres
Impaired activities - Swimming, boating
20. Water body - ***Lee State Park***
Location - Lee County
Surface acres - 2
Aquatic plants - Variable-leaf watermilfoil
Coverage - 1 acres
Impaired activities - Fishing, boating
21. Water body - ***Little Pee Dee State Park***
Location - Dillon County
Surface acres - 75
Aquatic plants - Spikerush, cowlily
Coverage - 15 acres
Impaired activities - Fishing, boating

22. Water body - ***Paris Mountain State Park - Lake Buckhorn***
Location - Greenville County
Surface acres - Unknown
Aquatic plants - Pondweed, Watershield
Coverage - 1 acre
Impaired activities - Recreation
23. Water body - ***Santee State Park - Swimming lake***
Location - Orangeburg County
Surface acres - Unknown
Aquatic plants - Coontail
Coverage - 10 acres
Impaired activities - Swimming, recreational activities
24. Water body - ***Sesquicentennial State Park***
Location - Richland County
Surface acres - 25 acres
Aquatic plants - Waterlily, watershield
Coverage - 10
Impaired activities - Swimming, fishing

AQUATIC PLANT MANAGEMENT STRATEGY

The following management strategies were developed for each identified problem area considered eligible for public funding. Planned expenditures are based on known available federal funds, estimated state funds and anticipated local support as of the date of this plan. For water bodies in which final funding is inadequate to conduct all proposed control operations, the extent of control will be reduced and priority areas and target plants will be determined by the Department of Natural Resources in cooperation with the local sponsor. A summary of proposed expenditures for 2003 and a location map of problem water bodies are located at the end of this section.

1. Ashepoo River (Colleton County)

1. Problem plant species
Water hyacinth
2. Management objective
Reduce water hyacinth populations to the greatest extent possible, throughout the river system.
3. Selected control method
Reward
4. Area to which control is to be applied
5 acres of water hyacinth throughout river
5. Rate of control agents to be applied
0.5 gallon per acre.
6. Method of application of control agents
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Reward to be applied periodically to water hyacinth from May through October, as needed.
8. Other control application specifications
All affected water users will be notified of proposed chemical control activities prior to application.
9. Entity to apply control agents
Commercial applicator
10. Estimated cost of control operations
\$429

11. Potential sources of funding

Colleton County (60%)

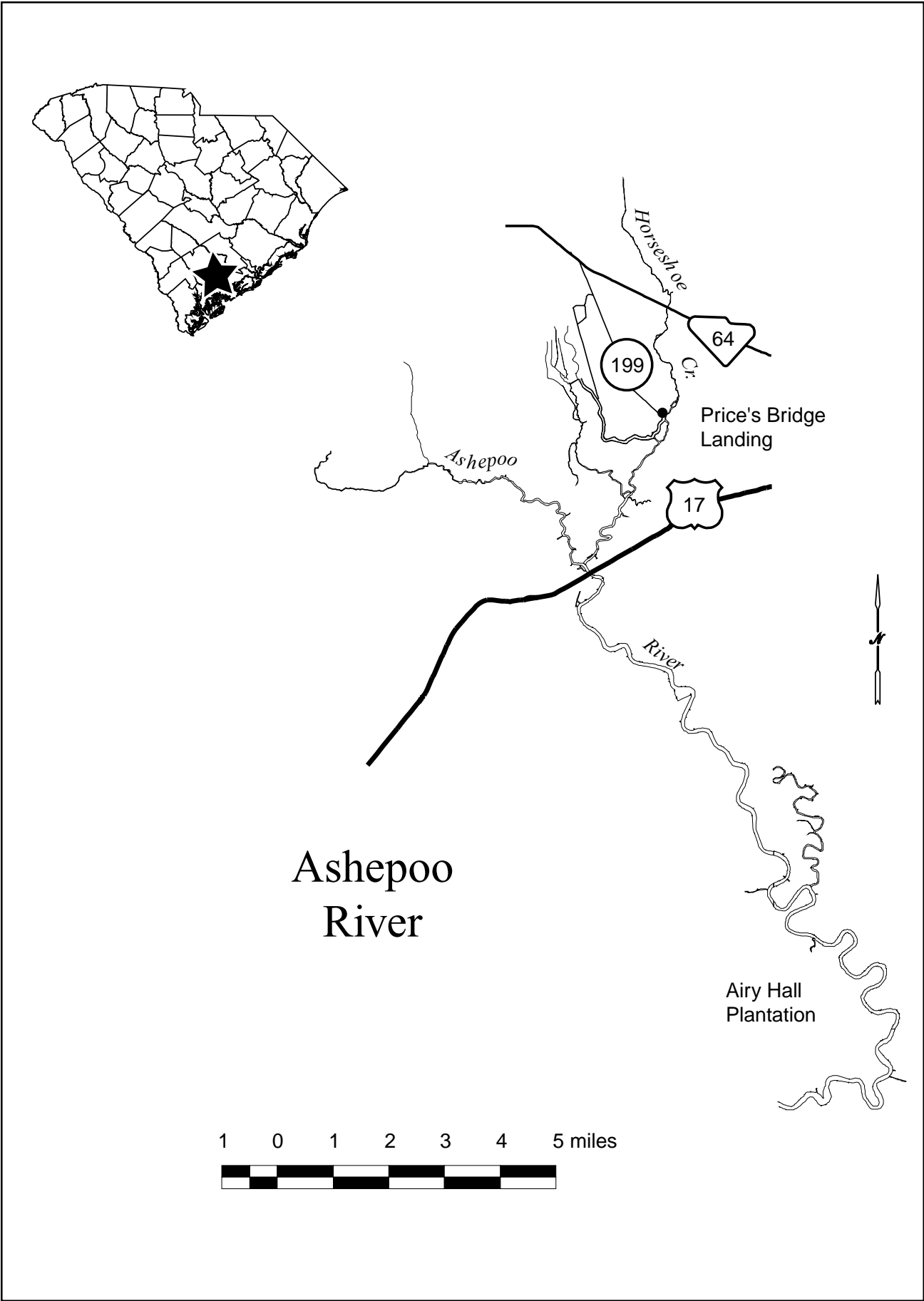
U.S. Army Corps of Engineers (40%)

S.C. Department of Natural Resources (Dependent upon state appropriations for FY03)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



2. Back River Reservoir

(Berkeley County)

1. Problem plant species

Hydrilla
Brazilian elodea
Water primrose

Water hyacinth
Fanwort

2. Management objectives

- a. Reduce water hyacinth and water primrose populations throughout the lake to enhance public access, navigation, water flow and minimize impacts to water intakes from floating islands.
- b. Reduce hydrilla in upper Foster Creek area to improve water quality, waterflow and navigation.
- c. Reduce hydrilla and fanwort in 60 acre area adjacent to SCE&G Williams Station intake to enhance water flow, minimize clogging of water intake, and enhance public boating and fishing use in this area.

3. Selected control method

Problem Species

Water hyacinth
Water primrose
Hydrilla, Brazilian elodea

Control Agent

Reward
Glyphosate
Chelated copper*

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

4. Area to which control is to be applied

Glyphosate - 40 acres of water primrose throughout lake.
Reward - 400 acres of water hyacinth throughout lake.
Chelated copper - 240 acres of hydrilla near SCE&G intake (4 treatments of 60 acre area).
Chelated copper - 20 acres of hydrilla in Back River arm.
Chelated copper - 5 treatments - 20 acres in Foster Creek arm

5. Rate of control agents to be applied

Glyphosate - 7.5 pints per acre.
Reward - 0.5 gallon per acre.
Chelated copper - up to 1 ppm (about 16 gallons per acre).

6. Method of application of control agents

Glyphosate, Reward - spray on surface of foliage with appropriate surfactant.
Chelated copper - subsurface injection from airboat.

7. Timing and sequence of control application

One hundred (200) acres of water hyacinths to be treated in the spring (April, May) and 200 acres in the fall (September, October). The initial treatments are to be followed in 1-2 days with a cleanup treatment.

Glyphosate to be applied to water primrose after initiation of flowering (June-August).

Hydrilla in Foster Creek to be treated five times (April-June) with Chelated copper.

Hydrilla located near the SCE&G water intake to be treated periodically during the year with Chelated copper (up to four times in the same 60 acre area), treatment area may be expanded as control is realized in target area.

8. Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Glyphosate treatments will be conducted at least 1/2 mile from the Charleston CPW water intake and Reward treatments will be conducted at least 1600 feet from the intake.

If filamentous algae is present on submersed macrophytes, an algicide, such as K-TEA, will be used in addition to selected herbicides to assist in control.

All affected water users will be notified of proposed chemical control activities prior to application. Following the application of Reward, herbicide residue concentrations may be monitored according to a plan agreed to by the S.C. Department of Natural Resources and the Department of Health and Environmental Control.

Control is to be applied in a manner that will not significantly degrade water quality in the treatment area. This may involve treating only a portion of the area at any one time.

9. Entity to apply control agents

Commercial applicator

10. Estimated cost of control operations

\$113,698

11. Potential sources of funding

Water primrose and water hyacinths -

Charleston Commissioners of Public Works and S.C. Electric and Gas Co. (60%)

U.S. Army Corps of Engineers (40%)

S.C. Department of Natural Resources (Dependent upon state appropriations for FY03.)

Hydrilla and Cabomba (near SCE&G intake) -

South Carolina Electric and Gas Co. (60%)

U.S. Army Corps of Engineers (40%)

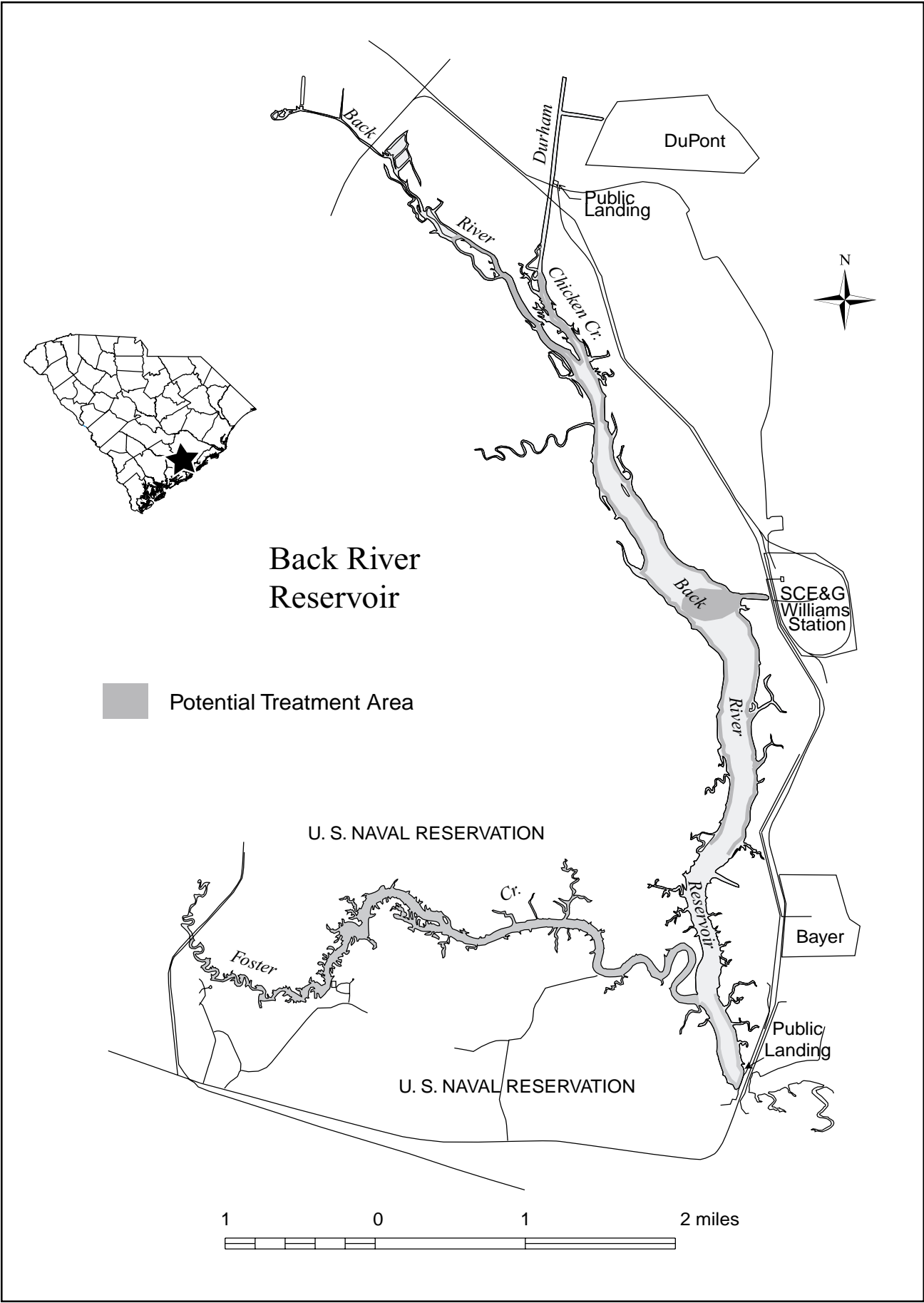
Hydrilla (Foster Creek, boat ramp, and Back River) -

Charleston Commissioners of Public Works and
U.S. Naval Weapons Station (100%)
S.C. Department of Natural Resources (Dependent upon state appropriations for
FY 03)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Effective long term control of water hyacinth in the reservoir must also include control of this species in the Cooper River to which the reservoir is connected.



3. Black Mingo Creek

(Georgetown County)

1. Problem plant species
Alligatorweed, Parrot feather, Frog's bit
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method

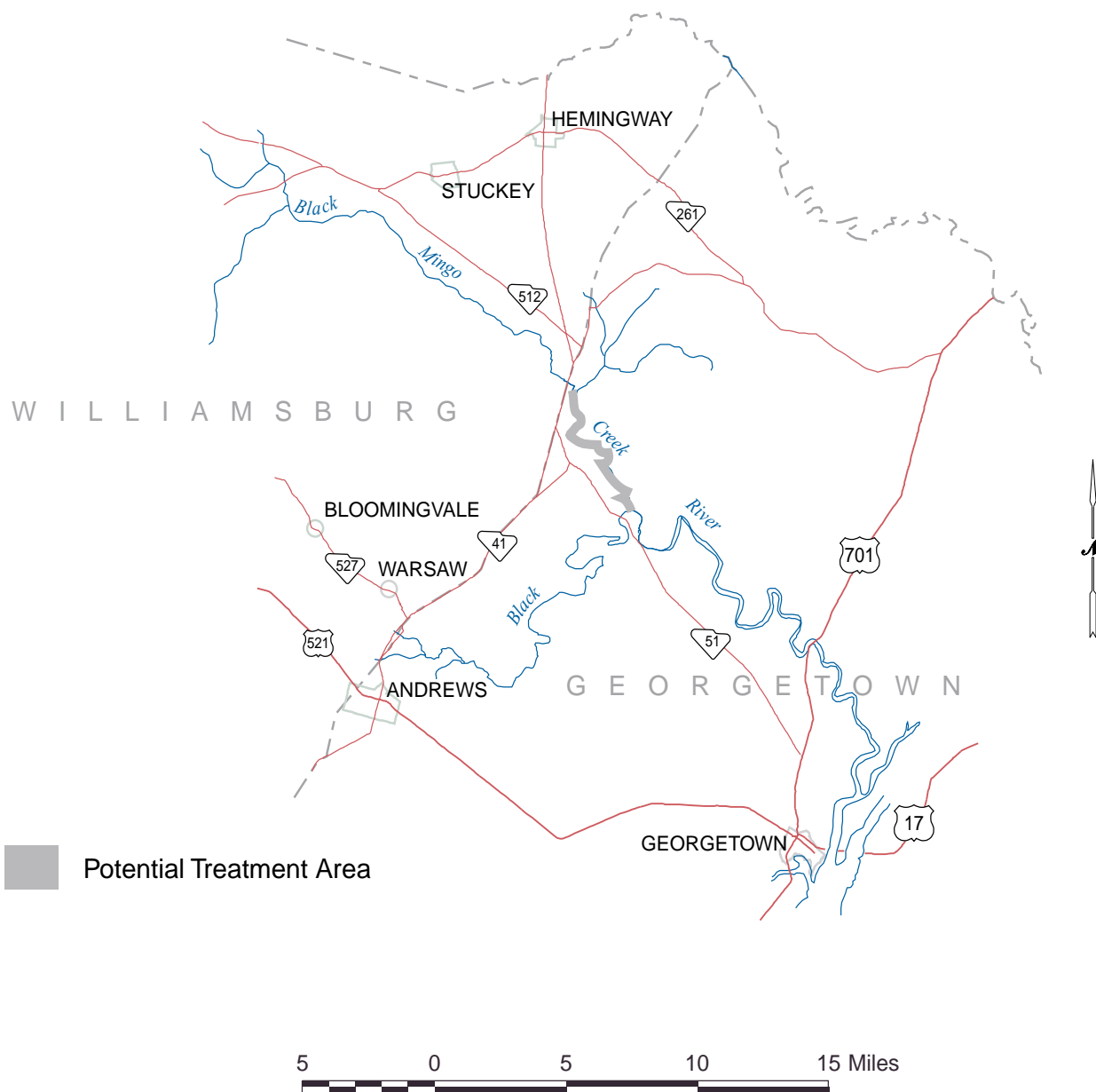
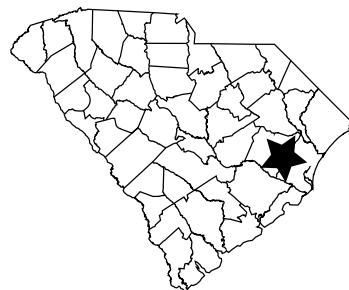
<u>Problem Species</u>	<u>Control Agent</u>
Alligatorweed	Glyphosate, Arsenal (EUP)
Frog's bit, Parrot feather	Reward
4. Area to which control is to be applied
20 acres of problematic plants throughout river
5. Rate of control agent to be applied
Reward - 0.5 gallon per acre.
Glyphosate - 6 pints per acre.
Arsenal (EUP) - 1.5 pints per acre.
6. Method of application of control agent
Spray on surface of foliage.
7. Timing and sequence of control application
Apply after plants are in full bloom (May - Oct.).
8. Other control application specifications
Arsenal to be applied under special restrictions and requirements stipulated on the experimental use permit.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$2,117
11. Potential sources of funding
Georgetown County (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups.

Black Mingo Creek



4. Black River

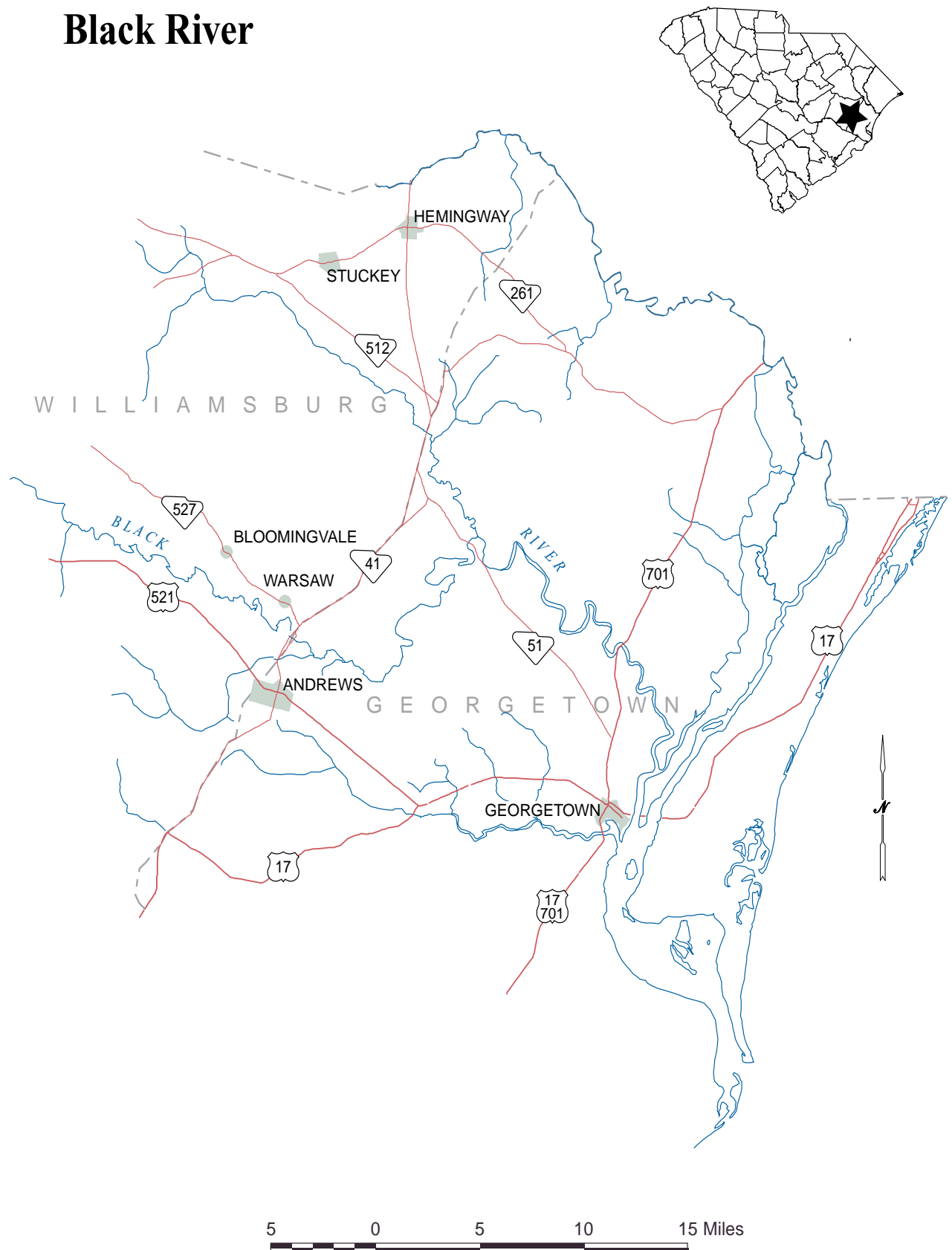
(Georgetown County)

1. Problem plant species
Alligatorweed
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method
Glyphosate
4. Area to which control is to be applied
Up to 30 acres.
5. Rate of control agent to be applied
Up to 7.5 pints per acre.
6. Method of application of control agent
Spray on surface of foliage.
7. Timing and sequence of control application
Apply after plants are in full bloom (May - Oct.).
8. Other control application specifications
None
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$2,246
11. Potential sources of funding
Georgetown County (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)
(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.

Black River



5. Combahee River (Borrow pit)

(Colleton County)

1. Problem plant species
Alligatorweed, Parrot feather, Frog's bit
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method

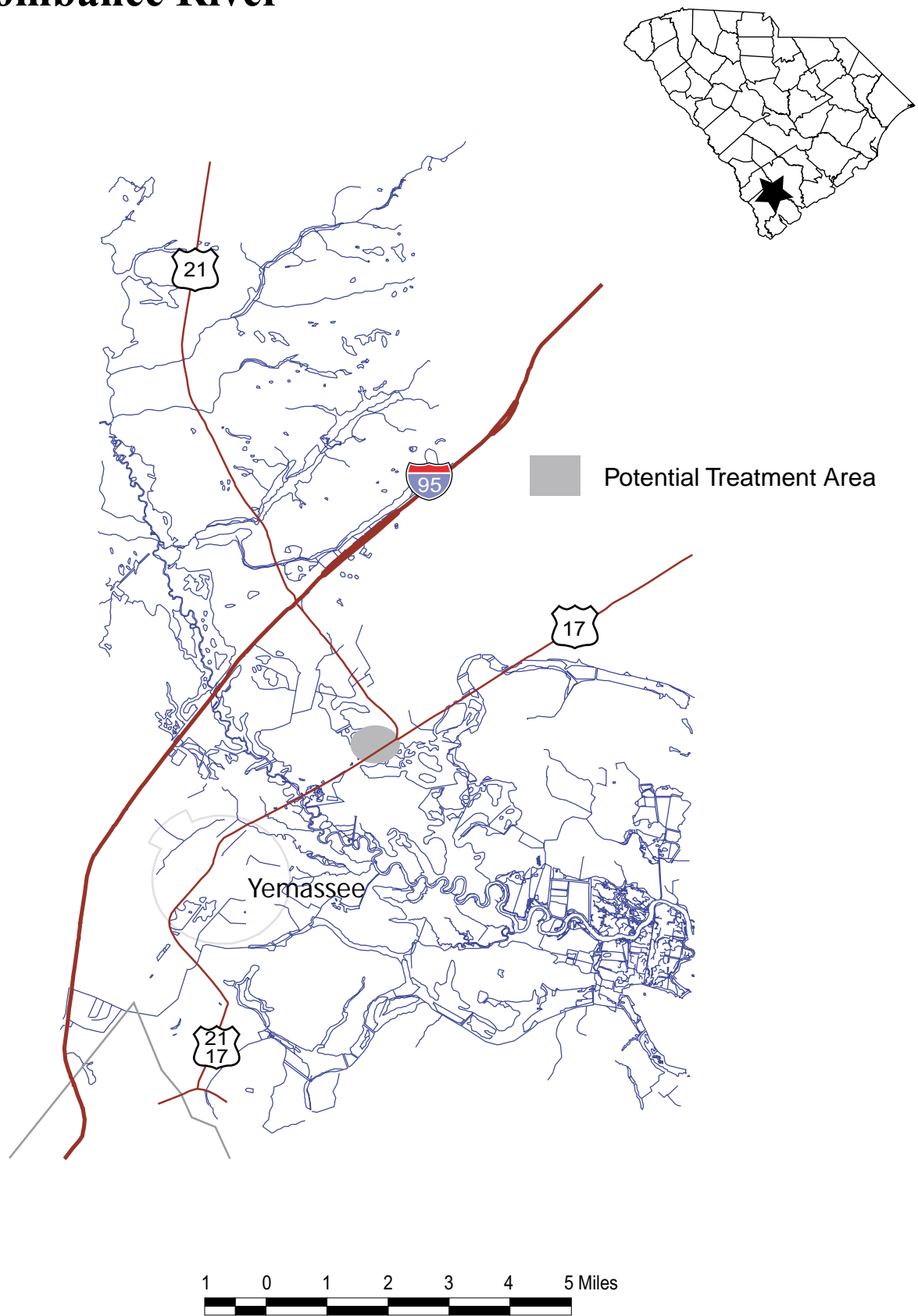
<u>Problem Species</u>	<u>Control Agent</u>
Alligatorweed	Glyphosate, Arsenal (EUP)
Frog's bit, Parrot feather	Reward
4. Area to which control is to be applied
12 acres of problematic plants.
5. Rate of control agent to be applied
Reward - 0.5 gallon per acre.
Glyphosate - 6 pints per acre.
Arsenal (EUP) - 1.5 pints per acre.
6. Method of application of control agent
Spray on surface of foliage.
7. Timing and sequence of control application
Apply after plants are in full bloom (May - Oct.).
8. Other control application specifications
Arsenal to be applied under special restrictions and requirements stipulated on the experimental use permit.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$1,351
11. Potential sources of funding
Colleton County (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups.

Combahee River



6. Cooper River

(Berkeley County)

1. Problem plant species

Hydrilla
Water primrose

Water hyacinth

2. Management objectives

- a. Reduce water hyacinth populations to the greatest extent possible in the main river and public ricefields.
- b. Reduce water primrose growth along boat channels to maintain navigation.
- c. Open limited boat trails in hydrilla infested ricefields to enhance public access to the river and selected ricefields.

3. Selected control method

Problem Species

Water hyacinth
Water primrose
Hydrilla

Control Agent

Reward
Glyphosate
Chelated copper*

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

4. Area to which control is to be applied

Reward - 450 acres of water hyacinths throughout river system
Glyphosate - 15 acres of water primrose in narrow boat channels in French Quarter Creek, Rice Hope Plantation ricefield, and Berkeley Yacht Club ricefield.
Chelated copper - 25 acres to open boat trails in Pimlico, Berkeley Yacht Club and Rice Hope Plantation ricefields.

5. Rate of control agents to be applied

Reward - 0.5 gallon per acre.
Glyphosate - 7.5 pints per acre.
Chelated copper - up to 1 ppm (about 16 gallons per acre)

6. Method of application of control agent

Glyphosate and Reward - spray on surface of foliage with appropriate surfactant.
Chelated copper - subsurface injection from airboat.

7. Timing and sequence of control application

All agents to be applied when plants are actively growing. Reward treatment to be conducted in early spring with subsequent maintenance treatments throughout the year. Glyphosate to be applied after plants are in bloom. Chelated copper treatment of boat trails to be conducted as close to low tide as possible to minimize water movement.

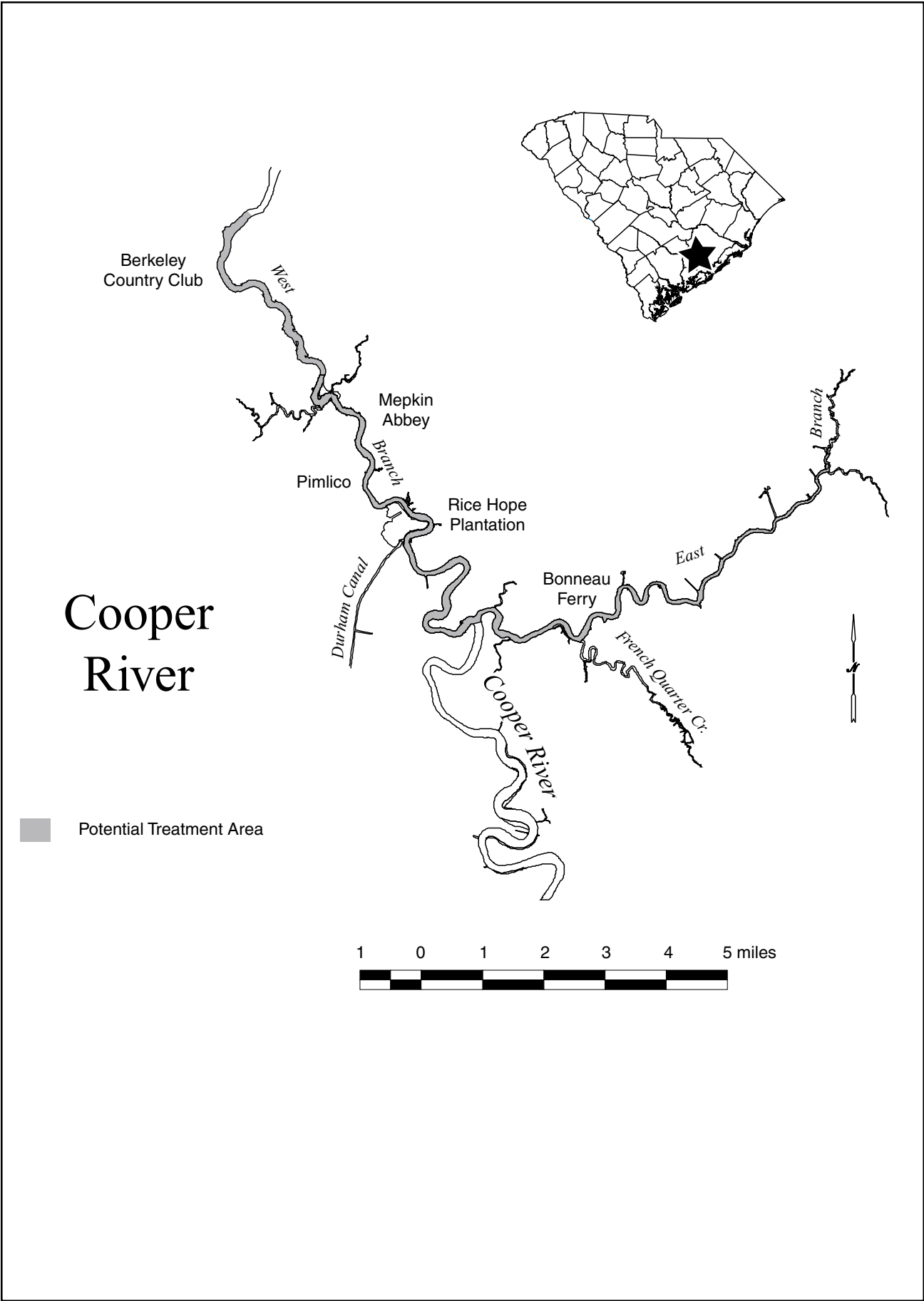
8. Other control application specifications

Treatment of water hyacinth is to be conducted in a manner that will not significantly degrade water quality.

9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$45,444
11. Potential sources of funding
Berkeley County (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03.)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy
 - a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
 - b. Maintain or enhance native aquatic plant populations at levels beneficial to wateruse, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
 - c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
 - d. Long term management must include consideration of water hyacinth control in many privately owned ricefields to which the public does not have boat access. Water hyacinth from these ricefields can reinfest public areas.



7. Goose Creek Reservoir

(Berkeley County)

1. Problem plant species

Water hyacinth	Water primrose
Water lettuce	
2. Management objective
 - a. Reduce water hyacinth and water lettuce populations to the greatest extent possible throughout the lake.
 - b. Reduce water primrose, water lettuce and water hyacinth in the upper portion of the lake to enhance water flow and public access.
3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Water primrose	Glyphosate
Water hyacinth	Reward
Water lettuce	Reward
4. Area to which control is to be applied

Glyphosate - 30 acres water primrose in upper lake and boat ramp.
 Reward - 100 acres of water hyacinth throughout lake.
 Reward - 75 acres of water lettuce throughout lake.
5. Rate of control agents to be applied

Glyphosate - up to 7.5 pints per acre.
 Reward - 0.5 gallon per acre.
6. Method of application of control agents

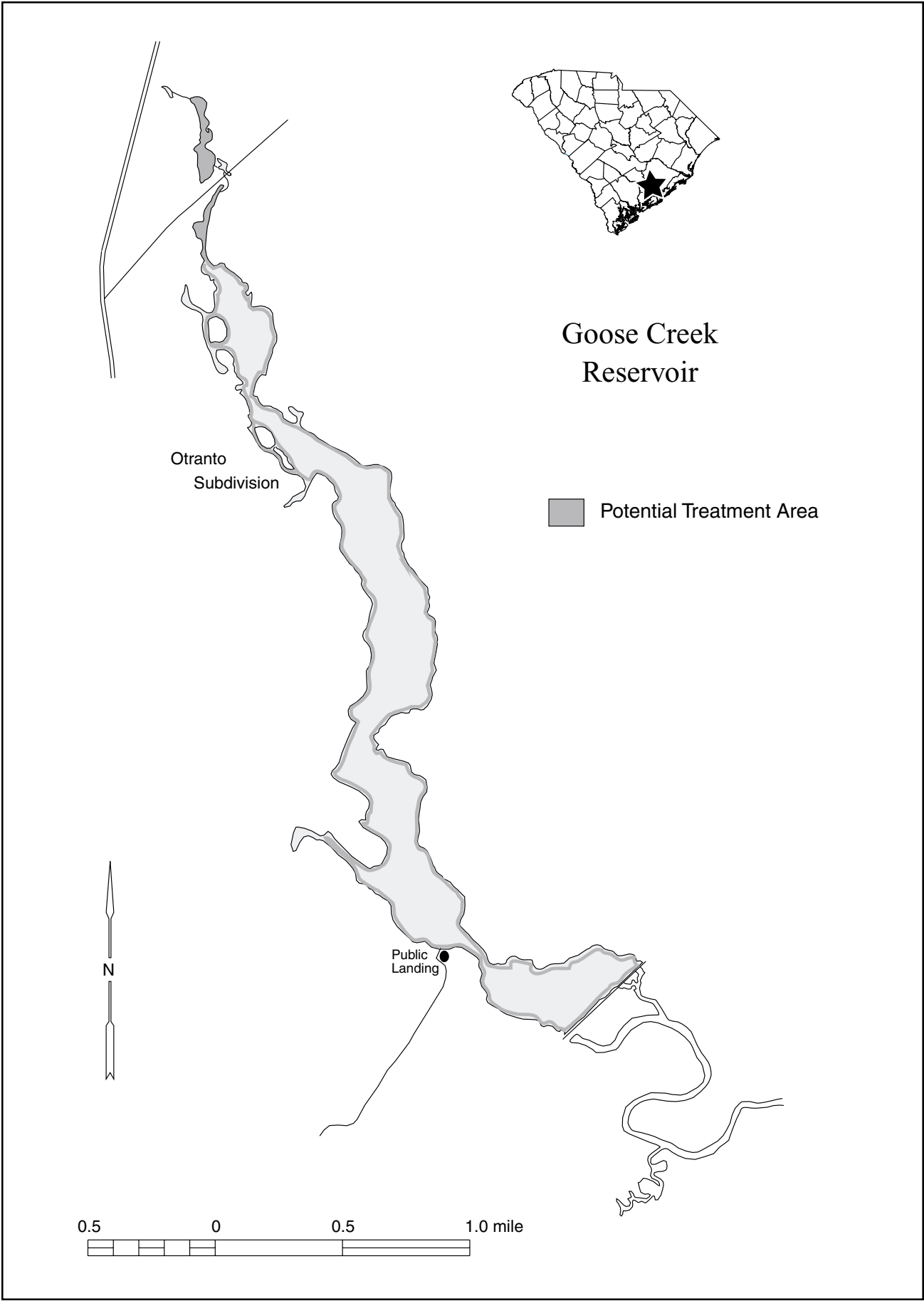
Glyphosate - spray on surface of foliage with appropriate surfactant.
 Reward - spray on surface foliage with appropriate surfactant.
7. Timing and sequence of control application

All agents to be applied when plants are actively growing. Apply Glyphosate just prior to and after plants are in bloom. Apply Reward to 150 acres of water hyacinth and 150 acres of water lettuce throughout the year May-October.
8. Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. Coordinate all control operations with Charleston Commissioners of Public Works and Goose Creek Reservoir Watershed Task Force.

Hydrilla continues to be adequately controlled by sterile grass carp. However, hydrilla populations will be carefully monitored and in the event that significant regrowth occurs during the year the Aquatic Plant Management Council may consider the need for additional grass carp.

9. Entity to apply control agents
Commercial Applicator
10. Estimated cost of control operations
\$17,522
11. Potential sources of funding
Charleston Commissioner of Public Works (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for
FY 03)
*(Federal and local funding amounts are subject to change based on availability of Federal
funds.)*
12. Long term management strategy
 - a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
 - b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
 - c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



8. Lake Greenwood

(Greenwood and Laurens County)

1. Problem plant species

Slender naiad
Pithophora

Hydrodictyon
Hydrilla

2. Management objectives

- a. Reduce slender naiad in developed shoreline areas and areas of high public access and use.
- b. Minimize the growth of filamentous algae in the Reedy River arm.

3. Selected control method

Problem Species

Control Agent

Slender naiad, Hydrilla
Pithophora, Hydrodictyon

Aquathol K
K-TEA*, Cutrine Plus

*** Maybe toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

4. Area to which control is to be applied

Aquathol K - 16 acres of slender naiad infestation.
Aquathol K - 50 acres of hydrilla infestation in upper Rabon Creek arm.
K-TEA, Cutrine Plus - Approximately 50 acres in upper Reedy River arm.

5. Rate of control agents to be applied

Aquathol K - 0.5 - 1.5 ppm (about 3- 5 gallons per acre depending on depth)
K-TEA - 0.5-1.0 ppm (approx. 10 gal per acre)
Cutrine Plus - 60 pounds per acre

6. Method of application of control agents

Aquathol K, K-Tea - Subsurface application by airboat with adjuvant.
Cutrine Plus - Apply evenly in treatment area with granular spreader.

7. Timing and sequence of control application

Agent to be applied to slender naiad when plants are actively growing but prior to seed production.
Agent to be applied to hydrilla when plants are actively growing but prior to tuber production.
Algae treatments will be conducted at first sign of regrowth to minimize potential coverage; however, treatments will begin after May 15th to avoid peak fish spawning period.

8. Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

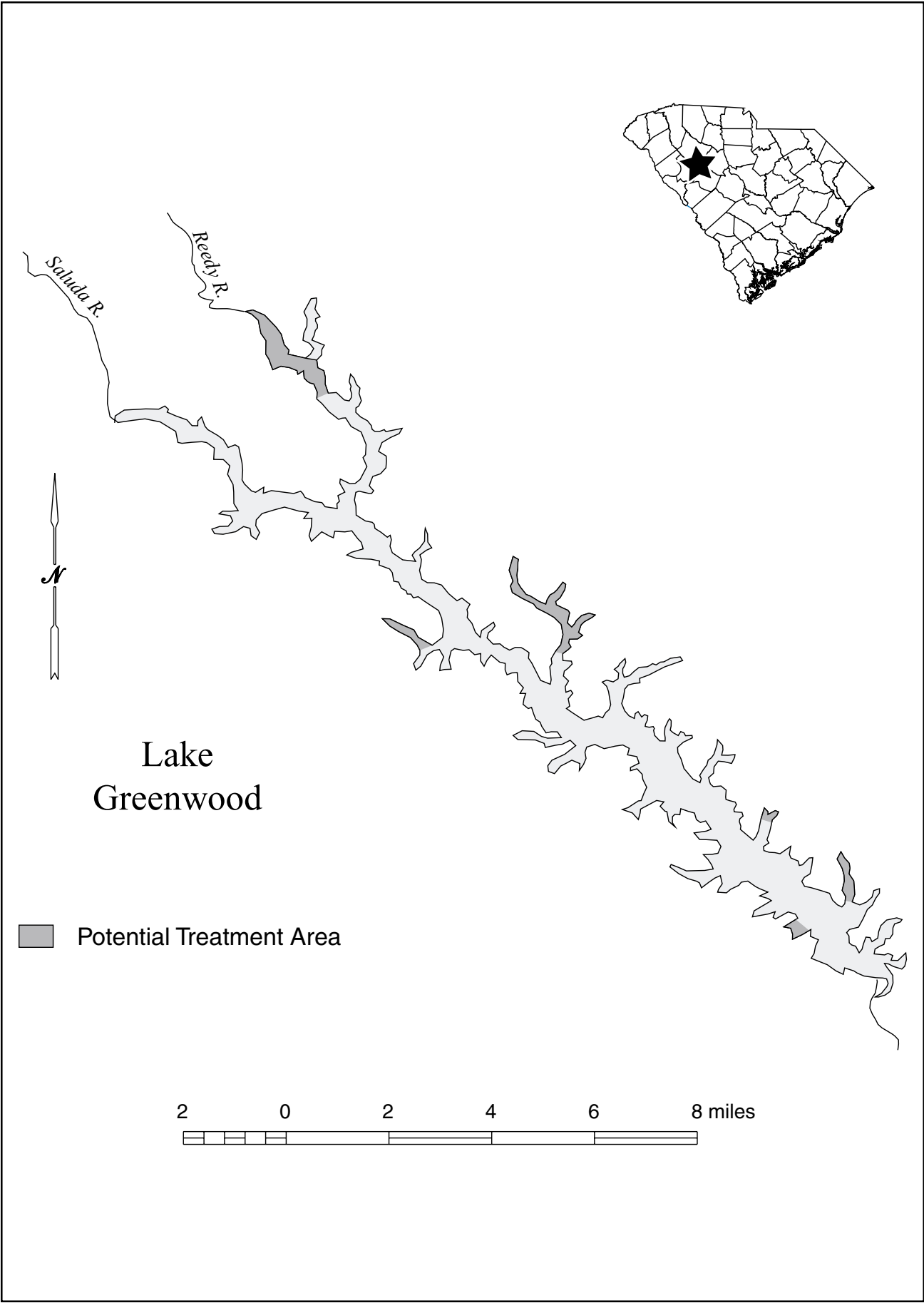
Treatment of control area is to be conducted in a manner that will not significantly degrade water quality. Survey and final determination of treatment areas to be conducted in conjunction with the South Carolina Department of Natural Resources district fisheries biologist. In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use.

Pithophora will require multiple treatments.

Hydrilla may require multiple treatments.

9. Entity to apply control system
Commercial applicator and/or Duke Power Company
10. Estimated cost of control operations
\$38,188
11. Potential sources of funding
Slender naiad -
Duke Power Company (60%)
U.S. Army Corps of Engineers (40%)

Filamentous algae -
Greenwood County (60%)
U.S. Army Corps of Engineers (40%)
(Federal and local funding amounts are subject to change based on availability of Federal funds.)
12. Long term management strategy
 - a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
 - b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
 - c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



9. Lake Keowee

(Pickens and Oconee County)

1. Problem plant species
Hydrilla
2. Management objectives
Keep hydrilla growth suppressed to minimize its spread within the lake, help prevent its spread to adjacent public waters and minimize adverse impacts to water use activities.
3. Selected control method
Chelated copper *
Fall/winter water level drawdown

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**
4. Area to which control is to be applied
Chelated copper - 10 acres
Drawdown - entire lake
5. Rate of control agent to be applied
Chelated copper - up to 1 ppm (about 16 gallons per acre)
Drawdown - to the greatest extent possible within project limits.
6. Method of application of control agent
Chelated copper - subsurface injection by airboat with adjuvant.
Drawdown - draw lake down.
7. Timing and sequence of control application
Herbicide application - when plants are actively growing.
Drawdown - drawdown lake from October through February.
8. Other control application specifications
Herbicide application - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.
9. Entity to apply control system
Herbicide application - Commercial applicator or Duke Power Company
Drawdown - Duke Power Company

10. Estimated cost of control operations

Herbicide application - \$2,237
Drawdown - Undetermined

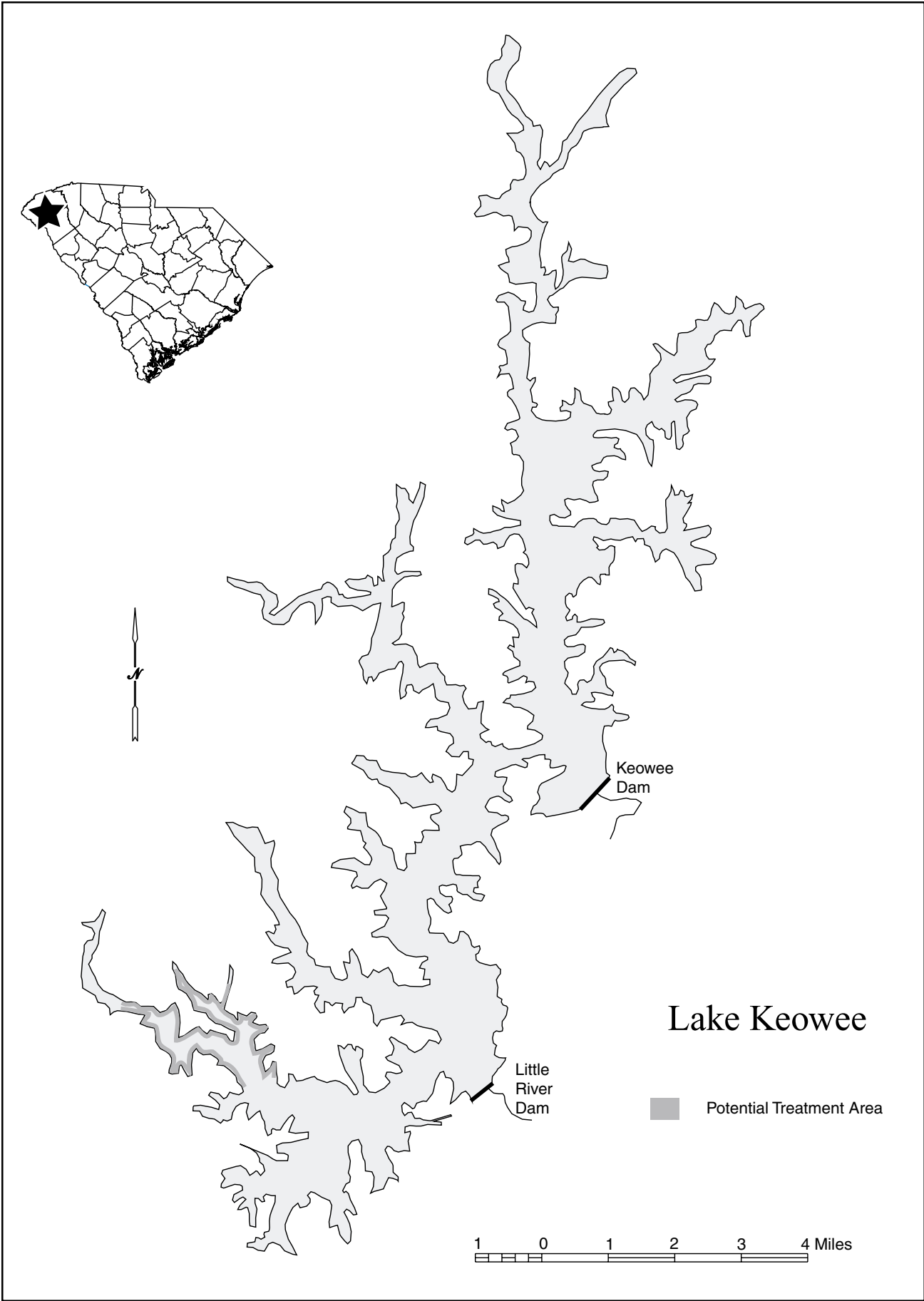
11. Potential sources of funding

Duke Power Company (60%)
U.S. Army Corps of Engineers (40%)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



10. Lake Marion

(Calhoun, Clarendon, and Sumter Counties)

1. Problem plant species

Hydrilla	Alligatorweed
Brazilian elodea	Fanwort
Water hyacinth	Slender naiad
Water primrose	Giant Cutgrass
Coontail	Filamentous algae (Lyngbya)

2. Management objectives

- Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.
- Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.
- Reduce water hyacinth populations throughout the lake, especially in the area above the I-95 bridge, to enhance boating, fishing, hunting, and public access.
- Reduce giant cutgrass populations throughout the lake, especially in the Santee Cooper Wildlife Management Area and upper lake near Lowfalls landing, to enhance waterfowl habitat and hunting opportunities.
- Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.

3. Selected control method

<u>Problem Species</u>	<u>Control Agents</u>
Hydrilla	Aquathol K, chelated copper*, Triploid grass carp†
Brazilian elodea, Lyngbya	Reward, chelated copper*, Hydrothol 191*
Water hyacinth	Reward
Fanwort, coontail, slender naiad,	Aquathol K, Sonar, Hydrothol 191*
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Arsenal (Experimental Use Permit)

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

- † **Triploid grass carp stocked in previous years substantially reduced hydrilla coverage in the main bodies of Lakes Marion and Moultrie during 1996-2001. Consequently, no additional grass carp stockings are planned for these areas in 2003. However, hydrilla populations will be carefully monitored and in the event that significant regrowth occurs during the year the Aquatic Plant Management Council may reconsider the need for additional grass carp.**
4. Area to which control is to be applied
- Water hyacinth - Approximately 500 acres throughout lake but mostly in the upper lake area above I-95 bridge.
- Hydrilla - Approximately 75 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.
- Giant Cutgrass - Approximately 150 acres along shoreline areas throughout lake system depending on availability of appropriate herbicides.
- Other target species - Approximately 175 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.
5. Rate of control agents to be applied
- Aquathol K - 6 to 10 gallons per acre (dependent on water depth)
 Reward - 0.5 gallon per acre for floating plants; two gallons per acre for submersed plants
 Arsenal - 2-3 pints per acre
 Sonar - 0.075 to 0.15 ppm
 Chelated Copper- 1 ppm
 Hydrothol 191 - up to 1 ppm
 Glyphosate - up to 7.5 pints per acre.
 Triploid grass carp - (See † footnote in Section 3 above)
6. Method of application of control agents
- Aquathol K, chelated copper, Sonar, Hydrothol 191 - subsurface application by airboat or surface application by helicopter with adjuvant.
 Reward - (water hyacinths) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant;(submersed plants) subsurface application with adjuvant .
 Glyphosate, Arsenal - spray on surface of foliage with appropriate surfactant.
 Triploid grass carp - (See † footnote in Section 3 above)
7. Timing and sequence of control application
- Herbicide applications -
 All herbicide applications to be applied when plants are actively growing.
 Water hyacinth treatments should be initiated in early spring when plant growth begins and continued regularly during the year as needed.
 Triploid grass carp - (See † footnote in Section 3 above)

8. Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Water hyacinth treatments should be considered a high priority to minimize spread to other areas of the lake system. Treatments should be conducted wherever the plants occur and access by boat is feasible. Frequent treatments in this area will be necessary to meet management objectives.

Arsenal to be applied under special restrictions and requirements stipulated on the experimental use permit.

9. Entity to apply control agents

S.C. Public Service Authority and/or commercial applicator.

10. Estimated cost of control operations

\$82,836

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2003.

11. Potential sources of funding

S.C. Public Service Authority (60%)

U.S. Army Corps of Engineers (40%)

S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)

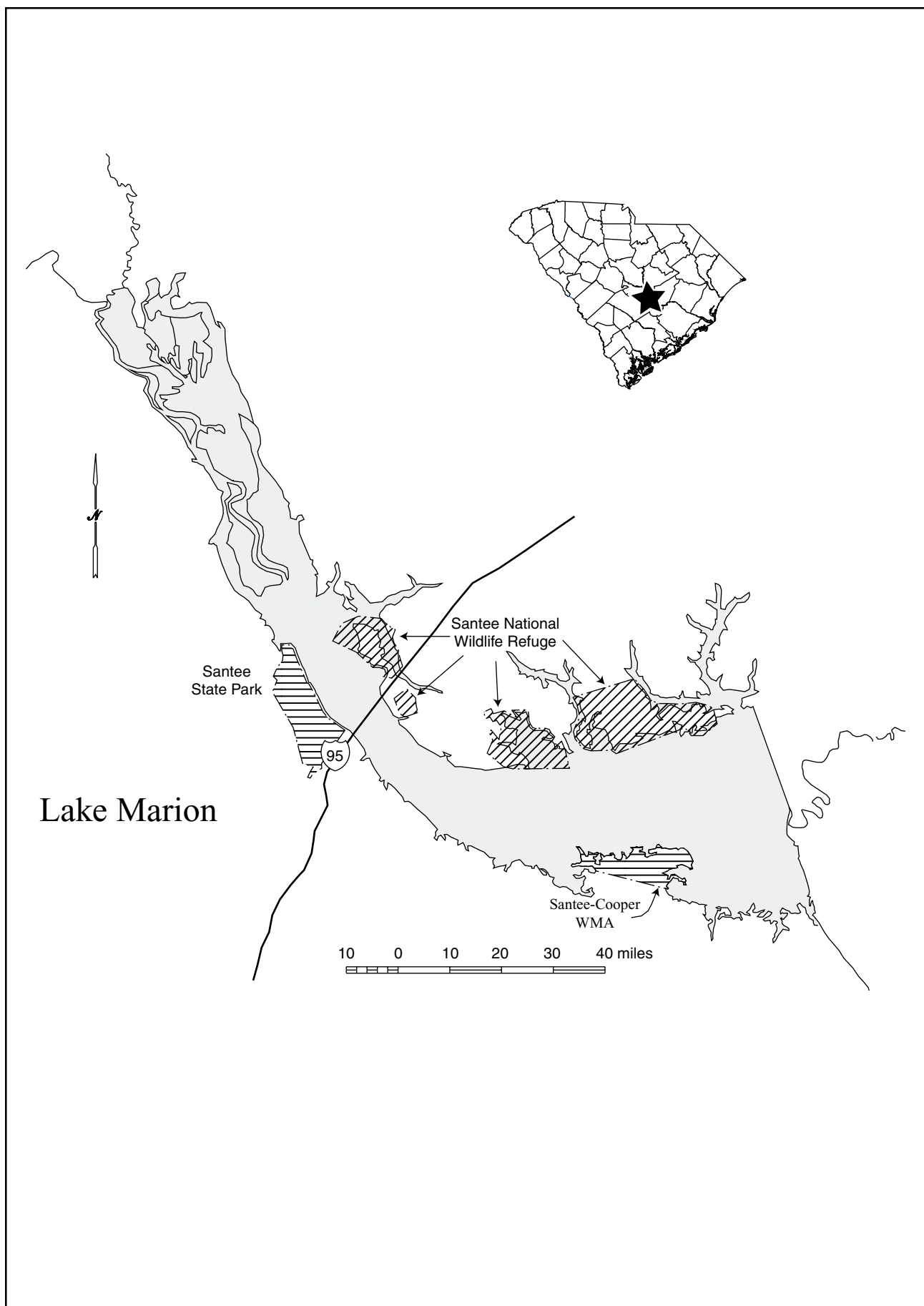
(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species.
- b. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- c. A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include periodic stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native

plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

- e. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- f. Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



11. Lake Moultrie

(Berkeley County)

1. Problem plant species

Hydrilla
Brazilian elodea
Water primrose
Fanwort
Giant Cutgrass

Slender naiad
Watermilfoil
Alligatorweed
Water hyacinth

2. Management objectives

- a. Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.
- b. Manage hydrilla growth throughout the main lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, municipal water withdrawals, and public use and access.
- c. Reduce water hyacinth populations throughout the lake to enhance boating, fishing, hunting, and public access.
- d. Reduce giant cutgrass populations throughout the lake to enhance waterfowl habitat and hunting opportunities.
- e. Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas.

3. Selected control method

Problem Species

Hydrilla

Brazilian elodea

Water hyacinth

Fanwort, slender naiad,
watermilfoil

Water primrose, alligatorweed
giant cutgrass

Control Agents

Aquathol K, chelated copper*, Sonar,
Triploid grass carp†

Reward, chelated copper*, Sonar,

Reward

Aquathol K, Sonar, Hydrothol 191*

Glyphosate, Arsenal (Experimental Use
Permit)

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

† Triploid grass carp stocked in previous years substantially reduced hydrilla

coverage in the main bodies of Lakes Marion and Moultrie during 1996-2001. Consequently, no additional grass carp stockings are planned for these areas in 2003. However, hydrilla populations will be carefully monitored and in the event that significant regrowth occurs during the year the Aquatic Plant Management Council may reconsider the need for additional grass carp.

4. Area to which control is to be applied

Hydrilla, fanwort, watermilfoil - Approximately 25 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas.

Giant cutgrass, water primrose, alligatorweed - Approximately 125 acres along shoreline areas throughout the lake.

5. Rate of control agents to be applied

Aquathol K - 6 to 10 gallons per acre (dependent on water depth)

Reward - 0.5 gallon per acre for floating plants; two gallons per acre for submersed plants

Arsenal - 2-3 pints per acre

Sonar - 0.075 to 0.15 ppm in treatment area

Chelated copper - 1 ppm

Hydrothol 191 - up to 1 ppm

Glyphosate- up to 7.5 pints per acre.

Other approved aquatic herbicides - as per label instructions.

Triploid grass carp - (See † footnote in Section 3 above)

6. Method of application of control agents

Aquathol K, chelated copper, Sonar, Hydrothol 191 - subsurface application by airboat or surface application by helicopter with adjuvant.

Reward - (water hyacinths) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant;(submersed plants) subsurface application with adjuvant .

Glyphosate, Arsenal - spray on surface of foliage with appropriate surfactant.

Triploid grass carp - (See † footnote in Section 3 above)

7. Timing and sequence of control application

All herbicides to be applied when plants are actively growing.

If needed, aerial treatment of hydrilla adjacent to the Rediversion Canal entrance should be performed as early as possible to prevent excessive plant growth and avoid impacts to the St. Stephen Hydropower Plant.

Triploid grass carp - (See † footnote in Section 3 above)

8. Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Treatment of lake, especially near the Rediversion Canal, should be coordinated with hydropower production to avoid excessive flows and maximize herbicide contact time.

Arsenal to be applied under special restrictions and requirements stipulated on the experimental use permit.

9. Entity to apply control agent

S.C. Public Service Authority and/or commercial applicator

10. Estimated cost of control operations

\$8,642

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2003.

11. Potential sources of funding

S.C. Public Service Authority (60%)

U.S. Army Corps of Engineers (40%)

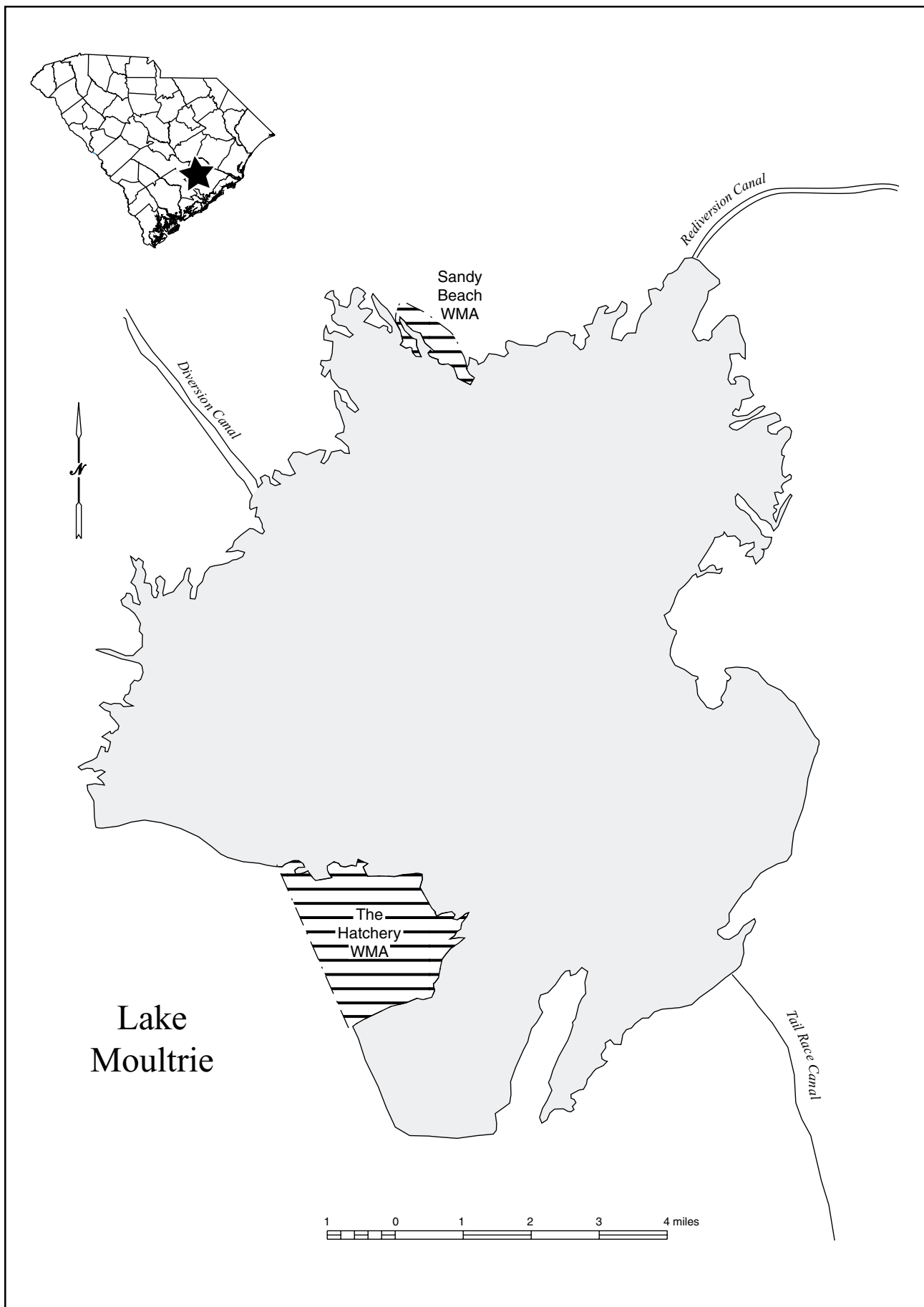
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species.
- b. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- c. A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include periodic stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- e. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the

- water body, and enforcement of existing laws and regulations.
- f. Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



12. Lake Murray

(Lexington, Newberry, Richland and Saluda Counties)

1. Problem plant species

Hydrilla

Illinois pondweed

2. Management objectives

- a. Reduce hydrilla and Illinois pondweed growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to drinking water withdrawals and public use and access.
- b. Achieve measurable reduction of hydrilla and Illinois pondweed within two-year draw-down time period.
- c. Maintain diverse aquatic plant community through selective application of control methods and introduction of desirable native plant species.

3. Selected control method

- a. Triploid (sterile) grass carp – long-term lake-wide control
- b. Mechanical harvester – short-term control in selected areas to provide public access.

4. Area to which control is to be applied

- a. Release triploid grass carp in areas of the lake with greatest hydrilla growth. Grass carp will be released in selected areas, such as boat ramps and park sites, around the lake to achieve as even a distribution as practicable.
- b. Use mechanical harvesters to provide immediate short-term control at high priority public access points, such as boat ramps and park sites.

5. Rate of control agent to be applied

- a. Initially stock 64,500 triploid grass carp. This represents a rate of 15 fish per vegetated acre for the estimated 4300 acres that occur below the 345-foot contour based on the 2002 survey. If hydrilla acreage in 2003 is greater than the original estimate of 4300 acres, additional grass carp may be stocked at the same rate (15 fish/vegetated acre) following Council approval.
- b. Harvest acreage as needed to provide public use and access.

6. Method of application of control agent

- a. Stock sterile grass carp using standard techniques to minimize loss.
- b. Use mechanical harvester as designed.

7. Timing and sequence of control application

- a. Triploid grass carp to be released as soon as possible in the spring of 2003 (March-May). **RESULTS FROM GRASS CARP MAY NOT BE EVIDENT FOR TWO OR MORE YEARS.** If hydrilla coverage is greater than 4300 acres during 2003, additional grass carp may be stocked later in the year (fall) following Council approval.
- b. Harvest aquatic growth as it becomes problematic; multiple applications are likely.

8. Other control application specifications

- a. If commercially available, all sterile grass carp will be a minimum of 12 inches in length. All sterile grass carp shipments for Lake Murray will be examined by the SCDNR for sterility, size, and condition at the Campbell Fish Hatchery in Columbia prior to stocking in the lake.
- b. Harvested vegetation must be removed from the lake and deposited on high ground. The harvesting process must minimize adverse impacts to fish.
- c. Control by Residential/Commercial Interests:

This plan is designed to provide relief from noxious aquatic vegetation for the public at large. Private entities such as lake-front residents and commercial interests may have site specific concerns not addressed immediately by the use of grass carp or mechanical harvesters at public access areas. **Residential and commercial interests may remove nuisance aquatic vegetation manually or by use of mechanical harvesting devices.** Of the three major control methods the following conditions apply.

1) Mechanical harvesters – Commercial aquatic plant harvesting services may be hired to remove hydrilla and Illinois pondweed from areas adjacent to residential and commercial property after notification of SCE&G. Harvesting precautions as stated in item b. above must be adhered to.

2) Aquatic herbicides – SCE&G opposes regular or general application of herbicides in Lake Murray, therefore, aquatic herbicides may not be applied in the lake.

3) Sterile grass carp - A sufficient number of grass carp are being stocked by SCDNR to control nuisance aquatic vegetation. Stocking additional grass carp in Lake Murray without written consent by the SCDNR is prohibited.

9. Entity to apply control agent

- a. Triploid grass carp - Commercial supplier with supervision by the SCDNR.
- b. Mechanical harvester – Commercial harvester under supervision of SCE&G at park sites and public boat ramps; private marina operators to contract for application at commercial boat ramps.

10. Estimated cost of control operations

- a. Triploid grass carp - \$322,500
- b. Mechanical harvester - \$500-1000/acre

11. Potential sources of funding

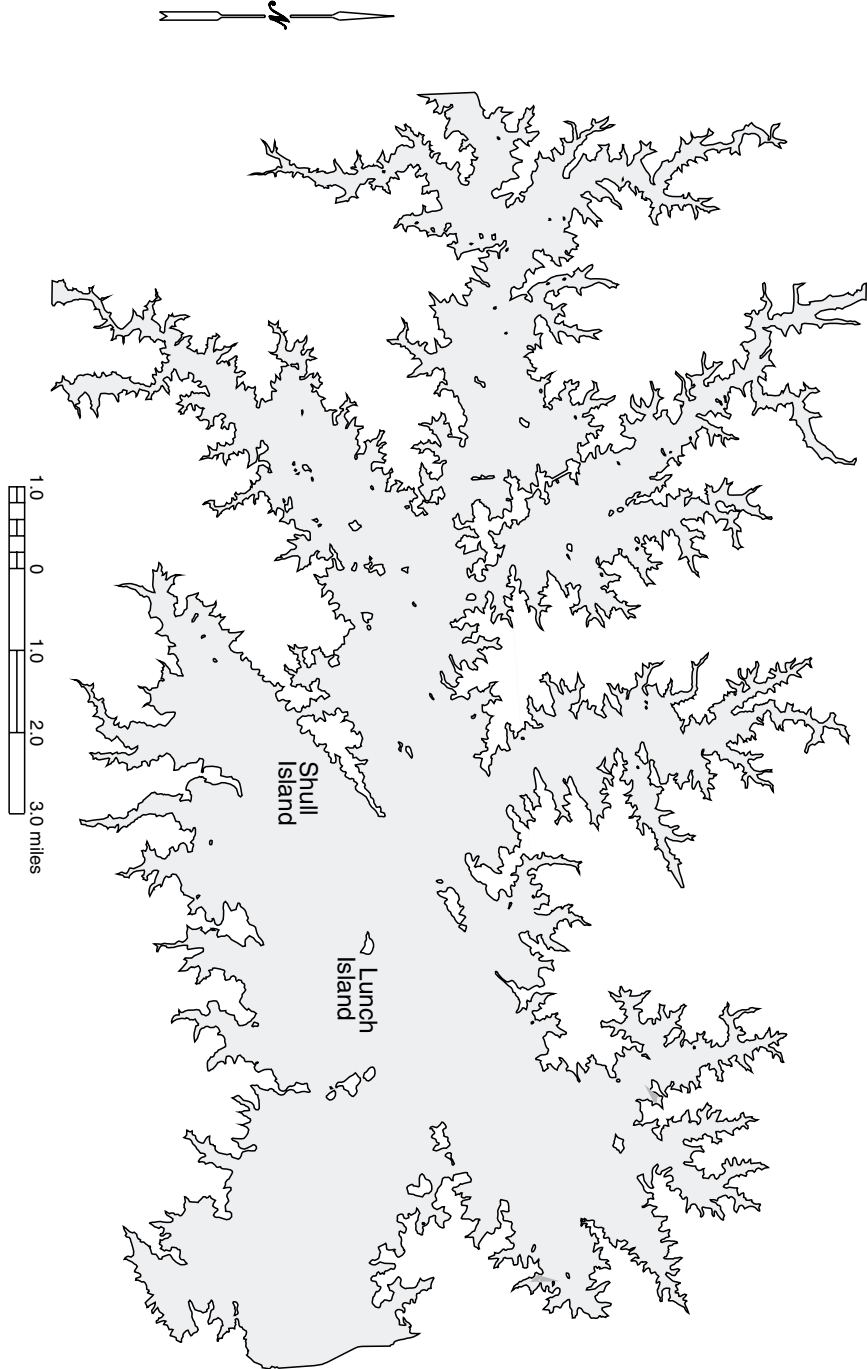
- a. Triploid grass carp
 - S.C. Electric and Gas Company, Lexington, and Richland Counties (60%)
 - U.S. Army Corps of Engineers (40%)
- b. Mechanical harvester
 - S.C. Electric and Gas Company, Commercial marina operators, and residential property owners

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Improve public awareness and understanding of aquatic plant management activities through the maintenance of the Lake Murray Aquatic Plant Management web site. The web site includes up-to-date information on annual management plans, dates and locations of current and historical control operations, locations of habitat enhancement activities, and other pertinent information.
- e. Periodically revise the management strategy and specific control sites as new environmental data and control agents and techniques become available, and public use patterns change.
- f. Continue investigating possible use of aquatic herbicides for site-specific treatments by modifying application techniques or temporary removal of aluminum boats to avoid possible adverse im-

Lake Murray



13. Lake Wateree

(Fairfield, Kershaw and Lancaster Counties)

1. Problem plant species
Hydrilla
2. Management objective
Keep hydrilla growth suppressed to prevent its spread within the lake, help prevent its spread to adjacent public water, and minimize adverse impacts to water use activities.
3. Selected control method
Aquathol K
Fall/winter water level drawdown
4. Area to which control is to be applied
Aquathol K - At least 2 acres in cove near Lakeside Marina.
Drawdown - Entire lake
5. Rate of control agent to be applied
Aquathol K - 4 ppm (about 8 gallons per acre depending on depth)
Drawdown - To the greatest extent possible within project limits.
6. Method of application of control agent
Aquathol K - Subsurface injection from airboat with adjuvant.
Drawdown - Draw lake down
7. Timing and sequence of control application
Aquathol K - 2 acres treated twice in June and again in fall of year.
Drawdown - Drawdown lake from October through February.
8. Other control application specifications
Aquathol K - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.
9. Entity to apply control agent
Herbicide application - Commercial applicator or Duke Power Company
Drawdown - Duke Power Company
10. Estimated cost of control operations
Herbicide application - \$2,438
Drawdown - Undetermined

11. Potential sources of funding

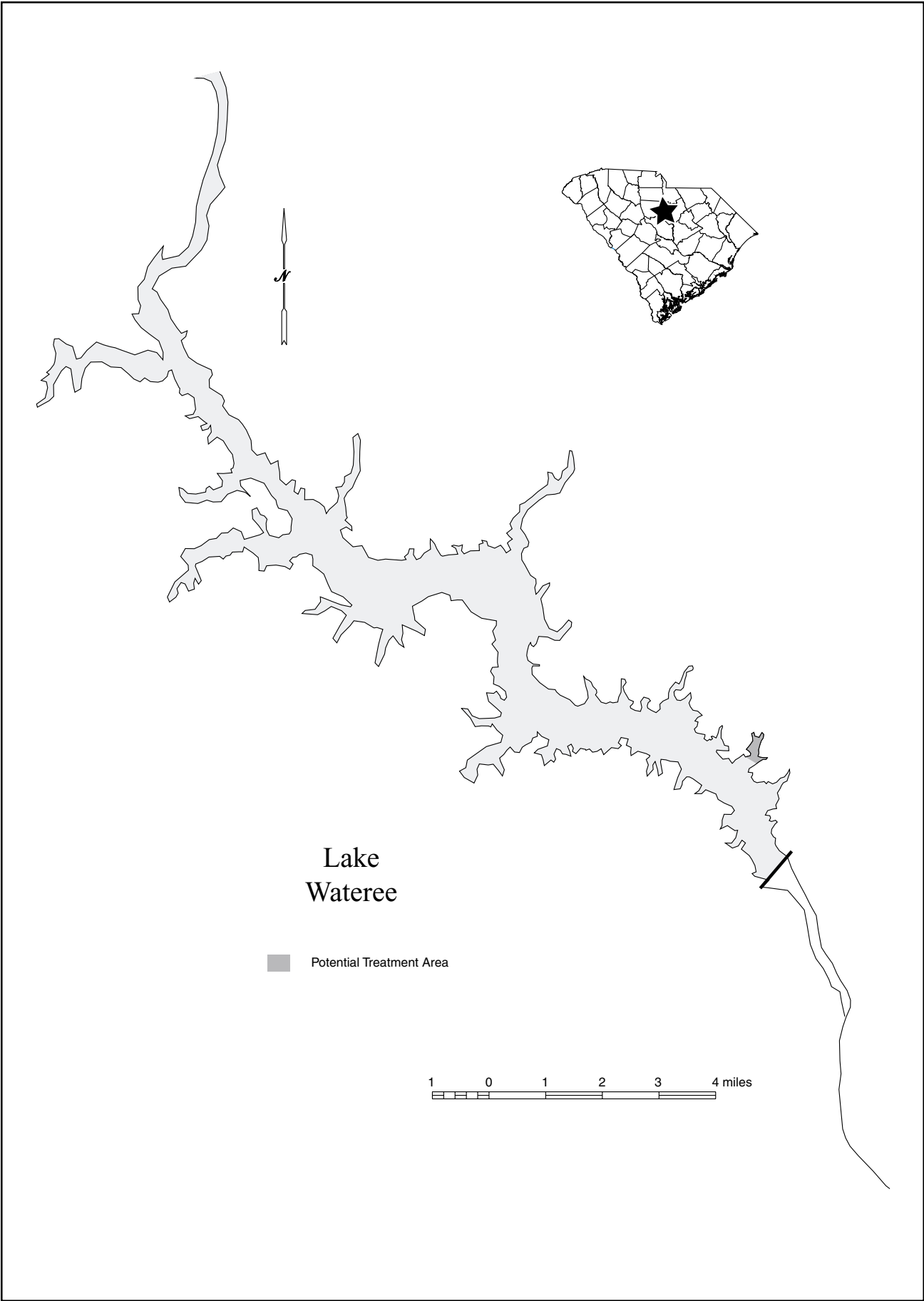
Duke Power Company (60%)

U.S. Army Corps of Engineers (40%)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



14. Little Pee Dee River

(Marion and Horry Counties)

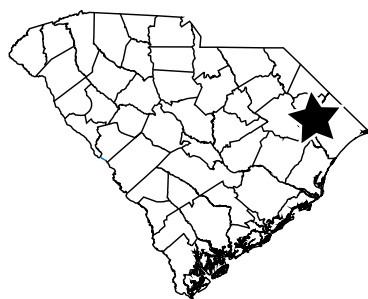
1. Problem plant species
Alligatorweed
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Alligatorweed	Glyphosate, Arsenal (EUP)
4. Area to which control is to be applied
50 acres of problematic plants throughout river
5. Rate of control agent to be applied
Glyphosate - 6 pints per acre.
Arsenal (EUP) - 1.5 pints per acre.
6. Method of application of control agent
Spray on surface of foliage.
7. Timing and sequence of control application
Apply after plants are in full bloom (May - Oct.).
8. Other control application specifications
Arsenal to be applied under special restrictions and requirements stipulated on the experimental use permit.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$6,298
11. Potential sources of funding
Horry and Marion Counties (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.



MARION CO.

Mullins

Gilcrest Landing

Fork Retch Landing

Red Bluff Landing

Sandy Bluff Landing

41

Galivants Ferry Landings

Knife Island Landing
Davis Landing

Huggins Landing

501

Locust Tree Landing
Gunters Lake Landing

908

HORRY CO.

Hughes Landing

Potato Bed Ferry Landing
Pitch Landing

378

Britton Neck

GEORGETOWN CO.

Great Pee

Russ Cr.

Pee

Dee

Dee River

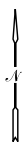
Swamp

Hunting

24

Little Pee Dee River

Potential Treatment Area



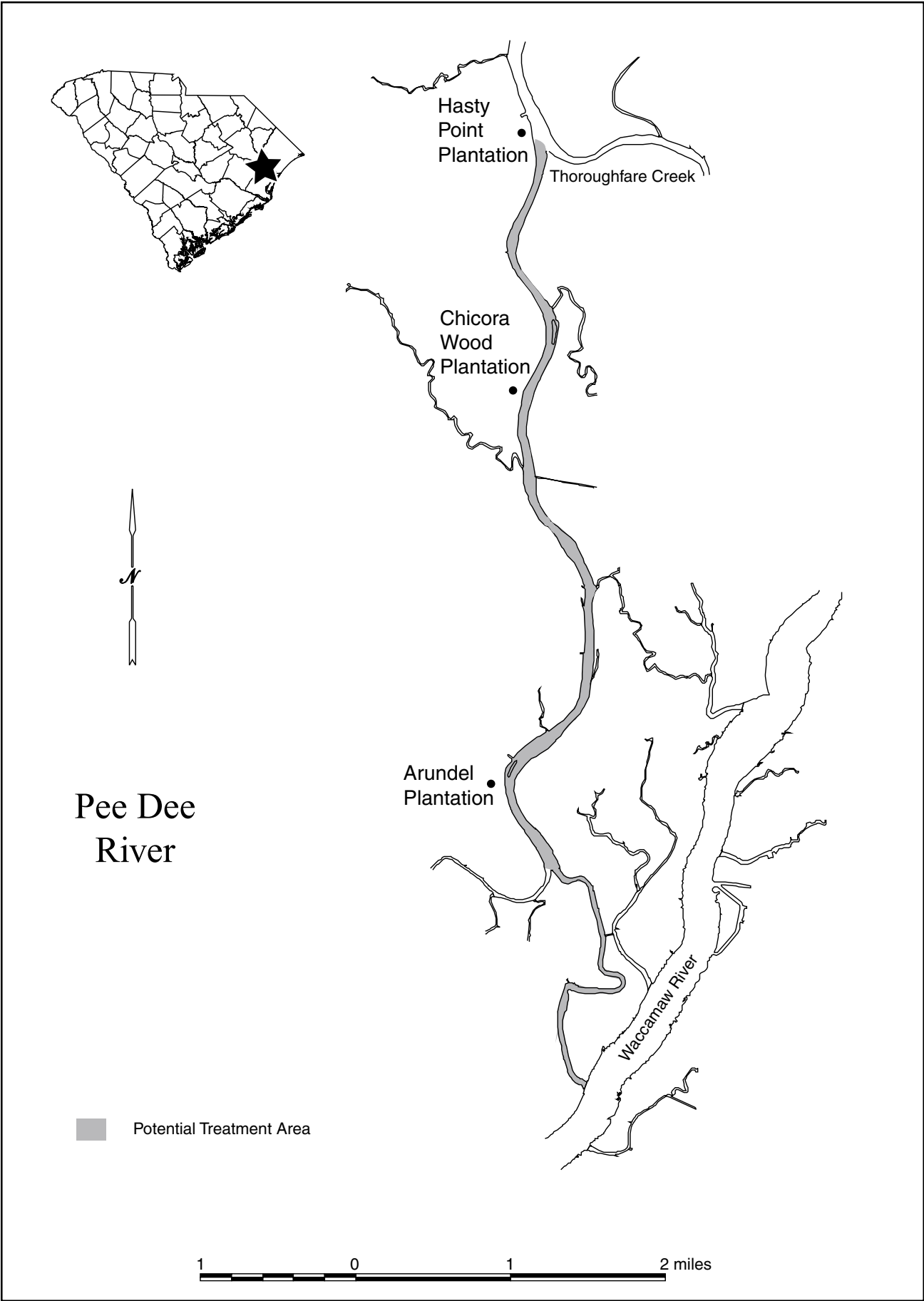
15. Pee Dee River

(Georgetown County)

1. Problem plant species
Water hyacinth
2. Management objective
Reduce water hyacinth populations to the greatest extent possible throughout river system.
3. Selected control method
Reward
4. Area to which control is to be applied
75 acres of water hyacinth throughout river and adjacent public ricefields.
5. Rate of control agent to be applied
0.5 gallons per acre.
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Reward to be applied periodically to water hyacinth from May through October.
8. Other control application specifications
None
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$6,433
11. Potential sources of funding
Georgetown County (60%)
U.S. Army Corps of Engineers (40%)
S.C. Department of Natural Resources (Dependent upon state appropriations for FY 03)
(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



16. Santee Coastal Reserve

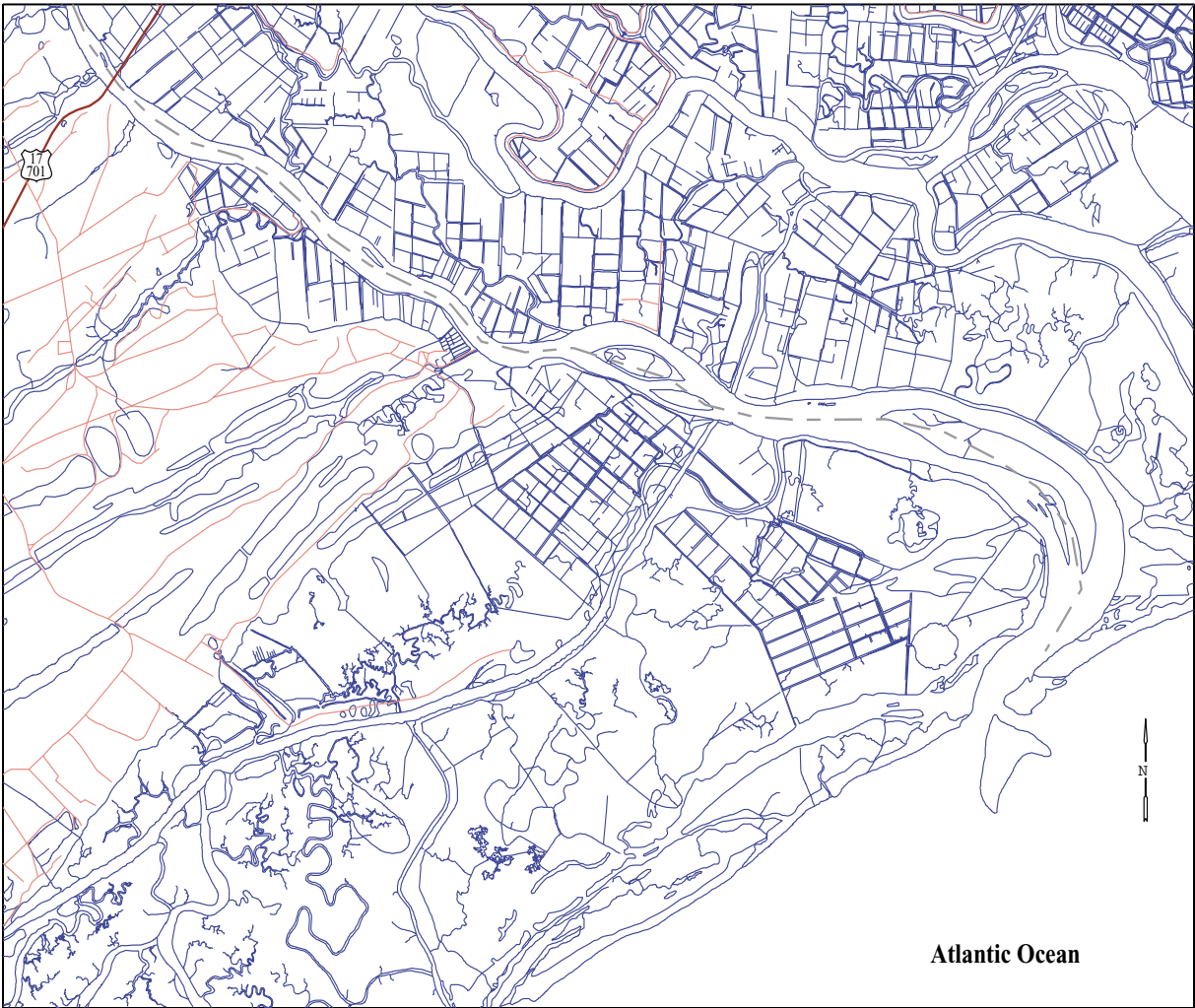
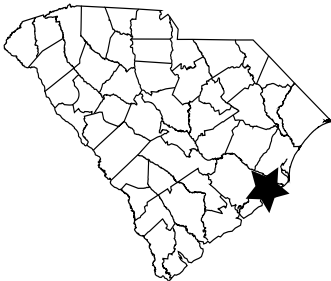
(Charleston County)

1. Problem plant species
Phragmites
2. Management objective
Reduce phragmites populations to the greatest extent possible throughout river system.
3. Selected control method
Rodeo and Arsenal (EUP) mix
4. Area to which control is to be applied
150 acres of phragmites throughout the ricefields.
5. Rate of control agent to be applied
Rodeo - 6 pints per acre
Arsenal (EUP) - 24 ounces per acre
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Rodeo and Arsenal (EUP) mix - Apply when plants are actively growing.
8. Other control application specifications
Application to be conducted by helicopter.
Arsenal to be applied under special restrictions and requirements stipulated on the experimental use permit.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$24,162
11. Potential sources of funding
Santee Coastal Reserve (100%)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Santee Coastal Reserve



Atlantic Ocean



17. Waccamaw River

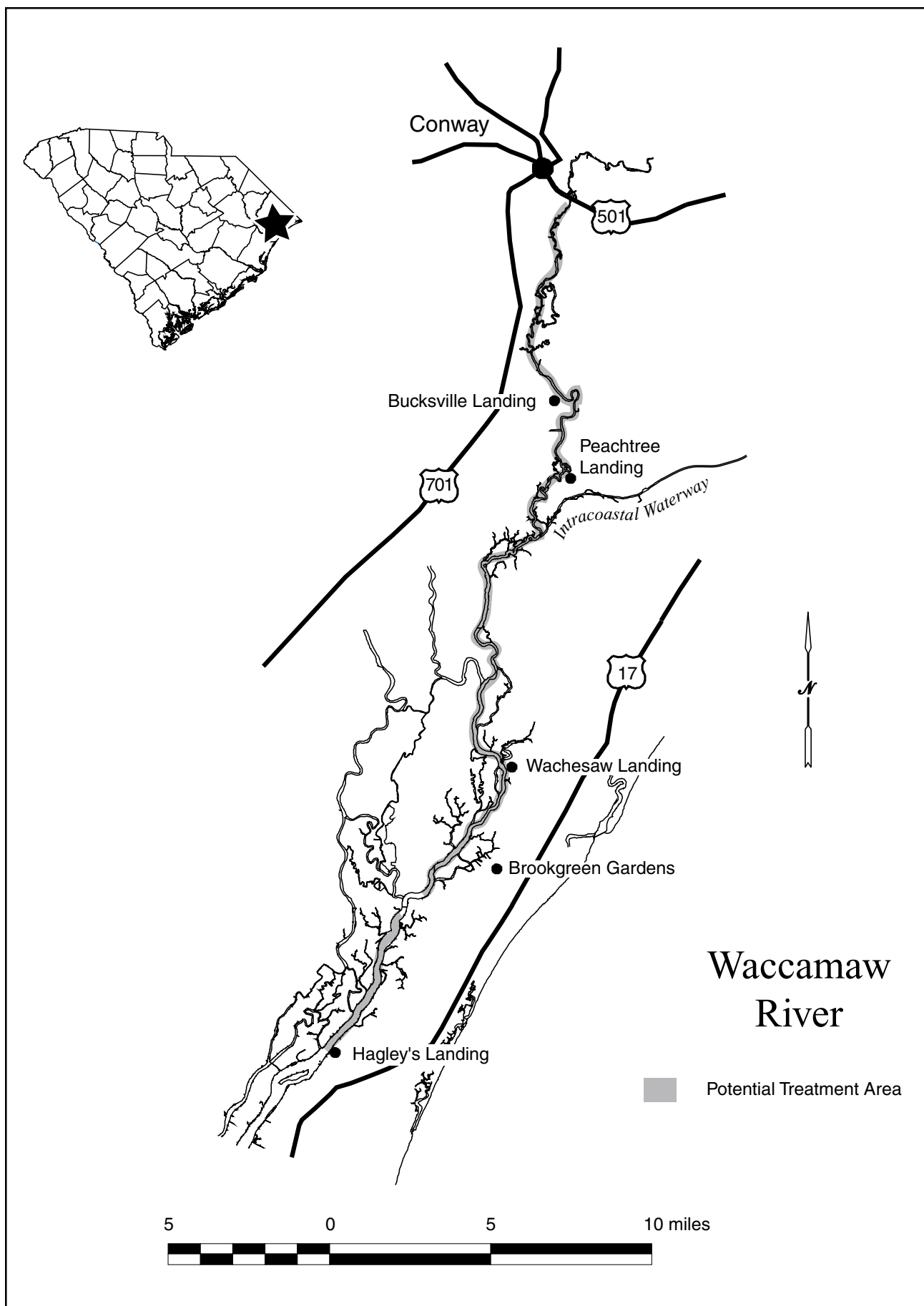
(Horry and Georgetown Counties)

1. Problem plant species
Water hyacinth
2. Management objective
Reduce water hyacinth populations to the greatest extent possible throughout the river system.
3. Selected control method
Reward
4. Area to which control is to be applied
75 acres throughout river system where needed.
5. Rate of control agent to be applied
0.5 gallons per acre
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant
7. Timing and sequence of control application
Reward to be applied to water hyacinth periodically from late May through November.
8. Other control application specifications
Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$6,433
11. Potential sources of funding
Horry and Georgetown Counties (60%)
U.S. Army Corps of Engineers (40%)

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



18. Charles Towne Landing State Park

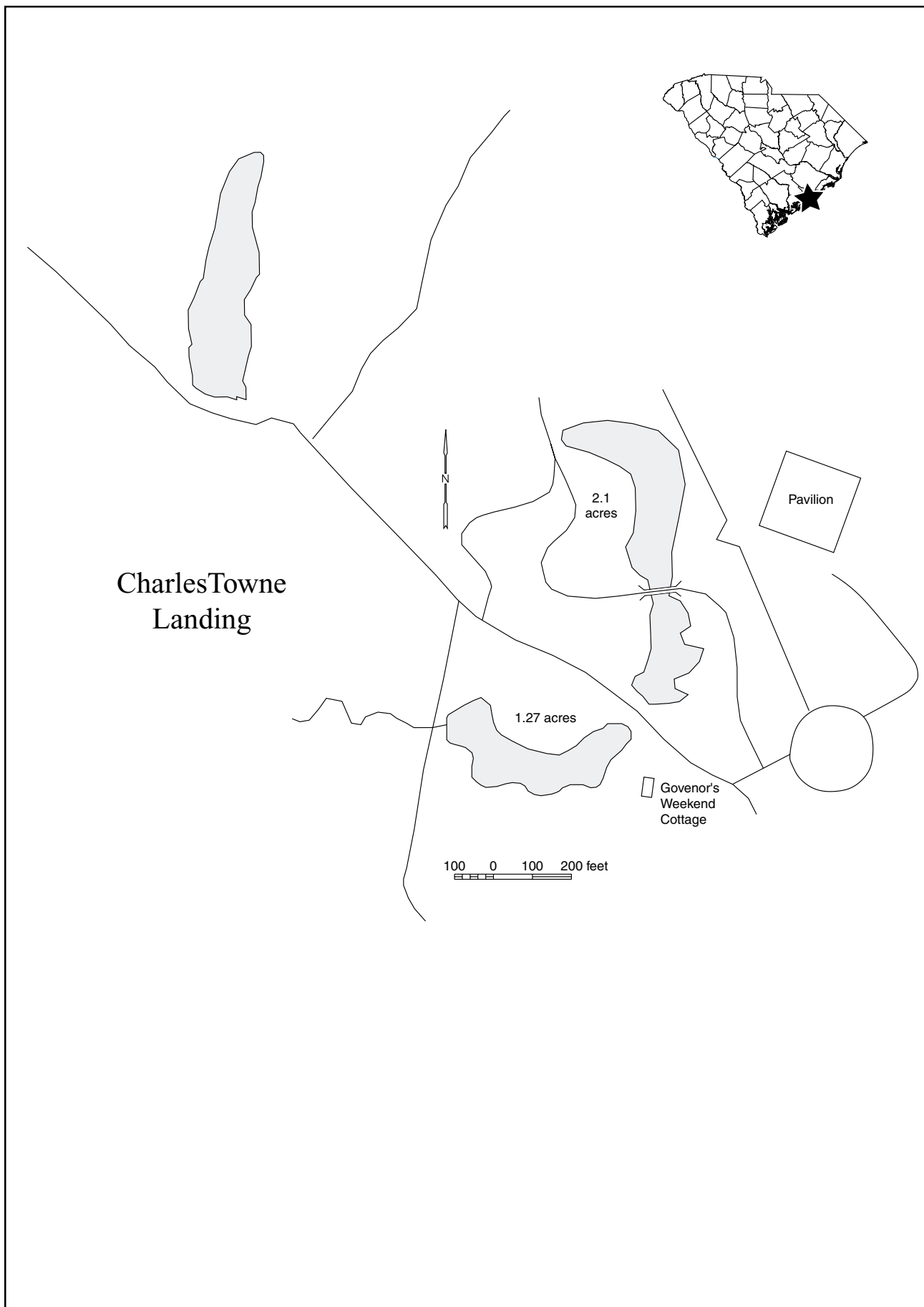
(Charleston County)

1. Problem plant species
Duckweed Alligatorweed Pennywort
2. Management objective
Reduce or remove problem plants to allow bank fishing and improve aesthetics.
3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Duckweed	Fluridone
Alligatorweed, pennywort	Glyphosate
4. Area to which control is to be applied
3 acres of duckweed
4 acre of alligatorweed and pennywort
5. Rate of control agents to be applied
Fluridone - 1 pint per acre
Glyphosate - 7.5 pints per acre
6. Method of application of control agents
Fluridone - Apply subsurface throughout lake
Glyphosate - Spray on surface of foliage with appropriate surfactant
7. Timing and sequence of control application.
Treat when plants are actively growing.
8. Other control application specifications
None
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$1,200
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (100%)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



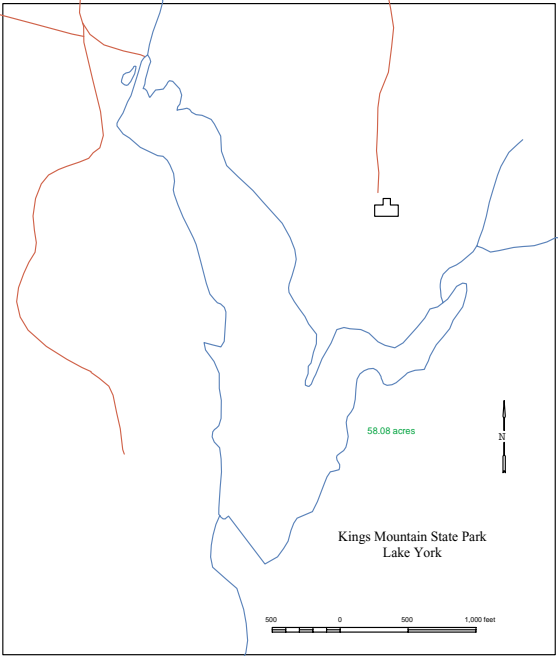
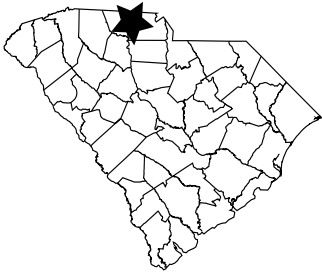
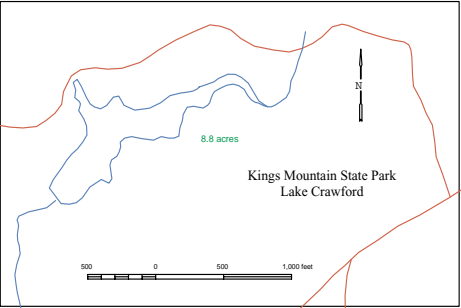
19. Kings Mountain State Park - Crawford Lake

(York County)

1. Problem plant species
Slender naiad
2. Management objective
Reduce or remove problem plants to the extent they do not interfere with recreation.
3. Selected control method
Aquathol K
4. Area to which control is to be applied
4 acres in swimming and paddle boat area
5. Rate of control agent to be applied
Four gallons per acre.
6. Method of application of control agent
Apply subsurface throughout lake
7. Timing and sequence of control application
Apply in May or June when naiad growth is initiated.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$2,000
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (100%)
12. Long term management strategy
 - a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Kings Mountain State Park



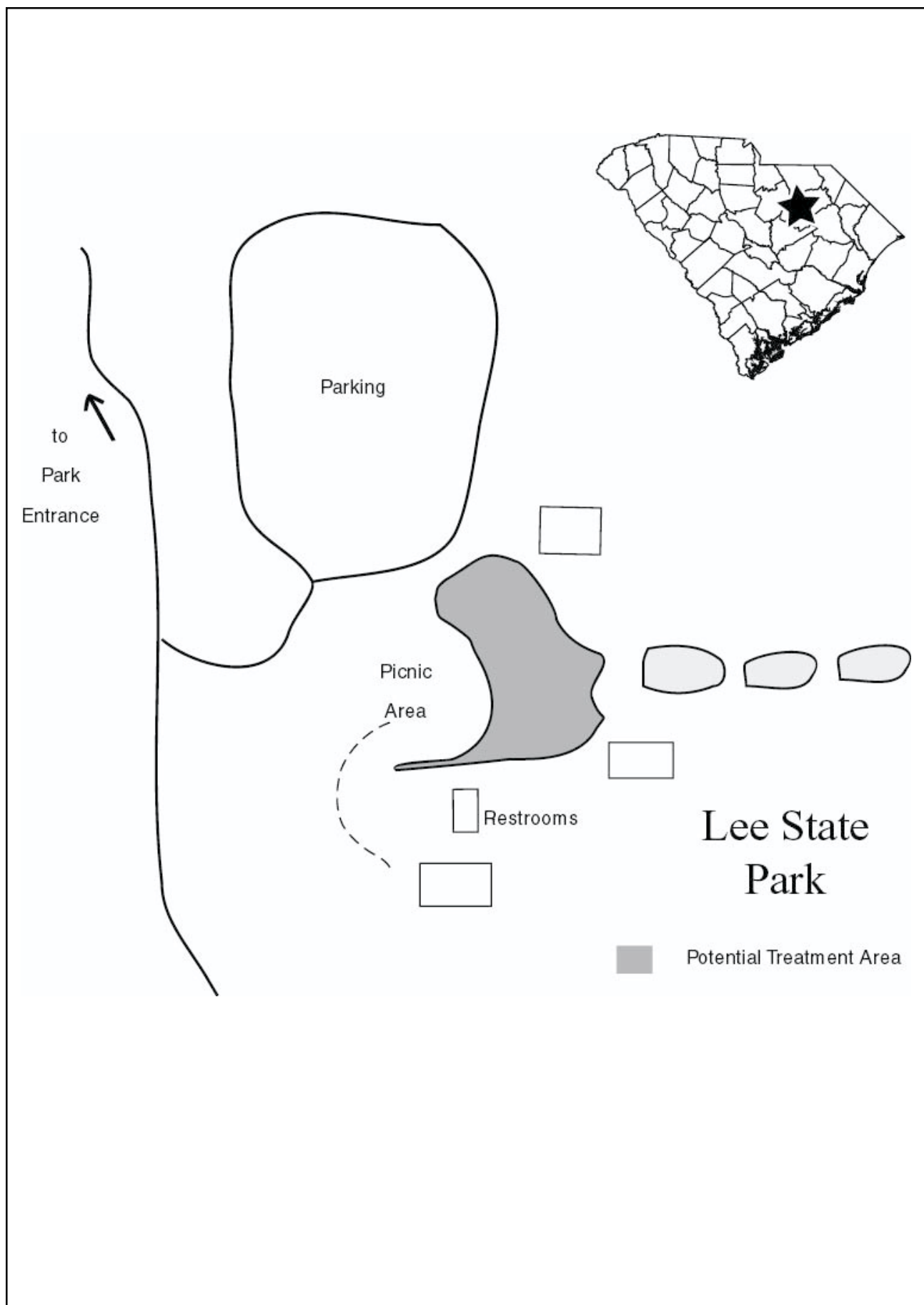
20. Lee State Park

(Lee County)

1. Problem plant species
Variable-leaf watermilfoil
2. Management objective
Reduce or remove problem plants to enhance recreational opportunities.
3. Selected control method
Triploid grass carp
4. Area to which control is to be applied
1 acre throughout lake
5. Rate of control agent to be applied
12 fish per vegetated acre (12 fish)
6. Method of application of control agent
Stock in lake
7. Timing and sequence of control application
Stock in the spring
8. Other control application specifications
Grass carp must be a minimum of 10 inches in length
9. Entity to apply control agent
Commercial supplier
10. Estimated cost of control operations
\$120
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (100%)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

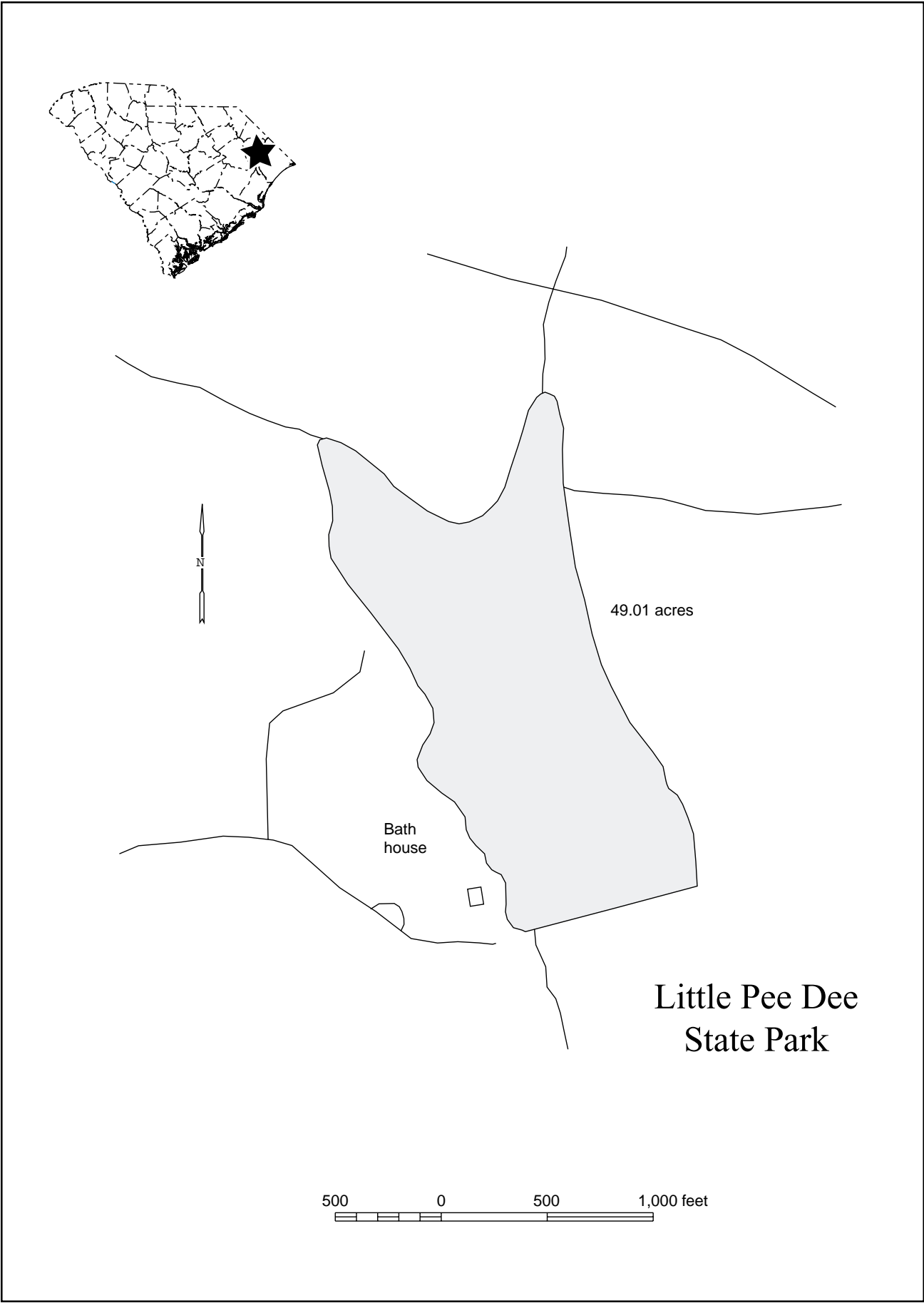


21. Little Pee Dee State Park

(Dillon County)

1. Problem plant species
 - Spikerush
 - Cowlily
3. Selected control method
 - 2,4-d BEE granular
4. Area to which control is to be applied
 - 15 acres adjacent to the parks day use area, along the park dam and adjacent to the campground
5. Rate of control agent to be applied
 - 200 lbs per acre
6. Method of application of control agent
 - Apply granular with spreader throughout lake
7. Timing and sequence of control application
 - Apply when plants are actively growing.
8. Other control application specifications
 - Monitor plant growth prior to treatment.
9. Entity to apply control agent
 - Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
 - \$9,750
11. Potential sources of funding
 - S.C. Department of Parks, Recreation and Tourism (100%)
12. Long term management strategy
 - a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.

- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



22. Paris Mountain State Park - Lake Buckhorn

(Greenville County)

1. Problem plant species
Pond weed
Watershield
2. Management objective
Reduce or remove problem plants to enhance recreational opportunities.
3. Selected control method
Fluridone
4. Area to which control is to be applied
1 acres
5. Rate of control agent to be applied
Fluridone - 1 pint per acre
6. Method of application of control agent
Fluridone - Apply subsurface throughout lake
7. Timing and sequence of control application
Apply when plants are actively growing.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$1,000
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (100%)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Map not available

23. Santee State Park - Swimming Lake

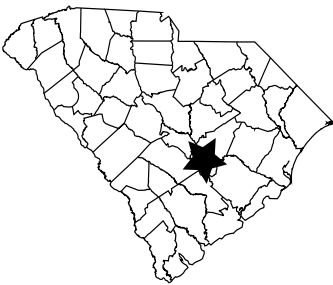
(Orangeburg County)

1. Problem plant species
Coontail
2. Management objective
Reduce or remove problem plants to enhance recreational opportunities.
3. Selected control method
Reward (Diquat)
4. Area to which control is to be applied
10 acres
5. Rate of control agent to be applied
2 gallons per acre
6. Method of application of control agent
Apply subsurface throughout lake
7. Timing and sequence of control application
Apply when plants are actively growing.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$750
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (100%)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Santee State Park



24. Sesquicentennial State Park

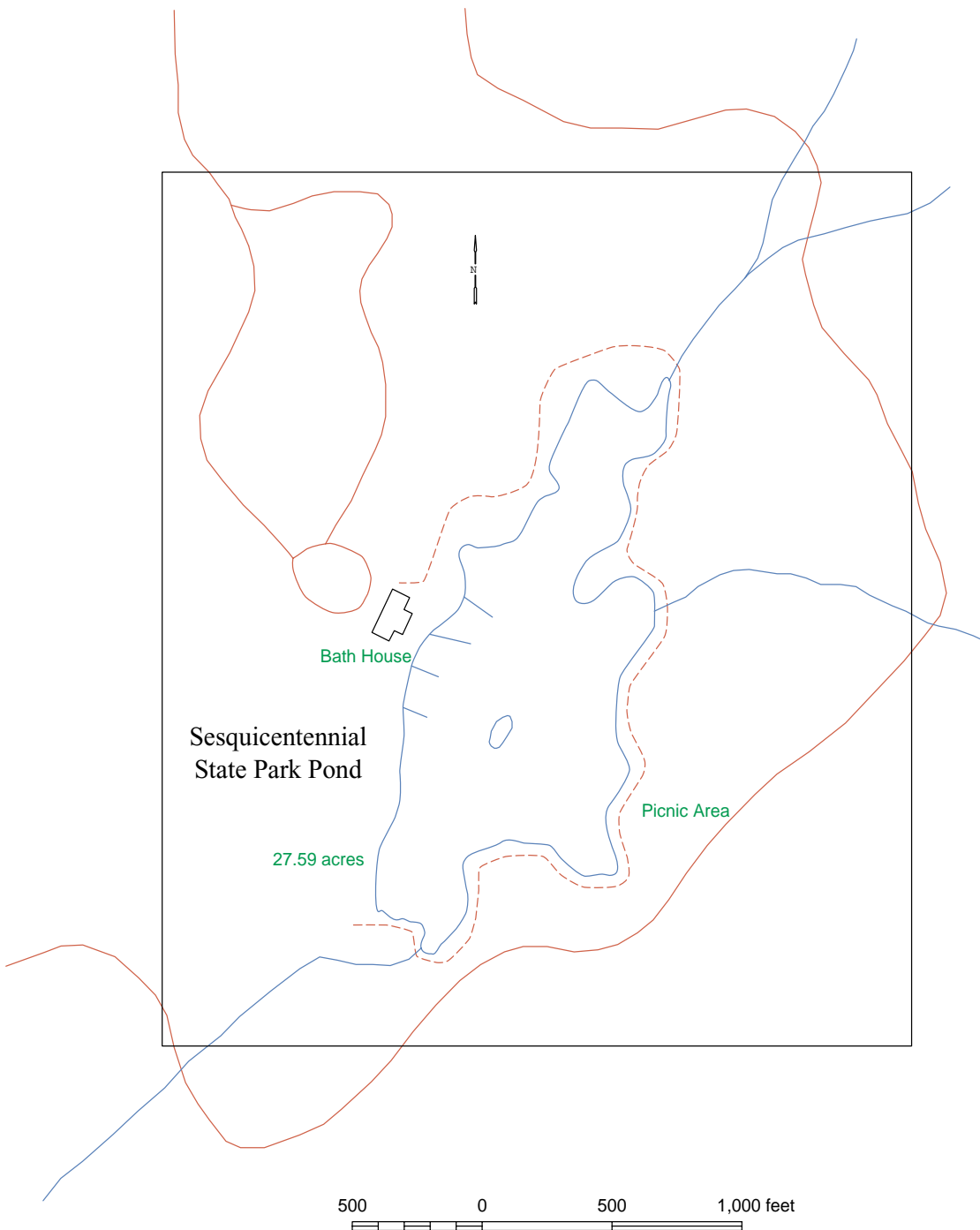
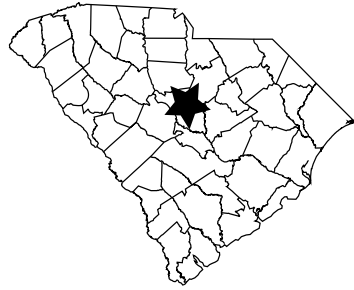
(Richland County)

1. Problem plant species
Waterlily
Watershield
2. Management objective
Reduce or remove problem plants to enhance recreational opportunities.
3. Selected control method
2,4-d BEE granular
4. Area to which control is to be applied
10 acres in swimming and bank fishing portions of the lake.
5. Rate of control agent to be applied
200 lbs per acre
6. Method of application of control agent
Apply granular with spreader throughout lake
7. Timing and sequence of control application
Apply when plants are actively growing.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$6,500
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (100%)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Sesquicentennial State Park



Summary of Planned Management Operation Expenditures For 2003

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
1. Ashepoo	\$429	\$172	\$0	\$257	Colleton Co.
2. Back River	\$113,698	\$38,322	\$0	\$75,376	SCE&G, CPW, Naval Weapons Station
3. Black Mingo Creek	\$2,117	\$847	\$0	\$1,270	Georgetown Co.
4. Black River	\$2,246	\$898	\$0	\$1,348	Georgetown Co.
5. Combahee River (Borrow Pit)	\$1,348	\$540	\$0	\$810	Colleton Co.
6. Cooper River	\$45,444	\$18,177	\$0	\$27,266	Berkeley Co., SCE&G
7. Goose Creek	\$17,522	\$7,009	\$0	\$10,513	CPW
8. Lake Greenwood	\$38,188	\$15,275	\$0	\$22,913	Greenwood Co.
9. Lake Keowee	\$2,237	\$895	\$0	\$1,342	Duke Power
10. Lake Marion	\$82,836	\$33,134	\$0	\$49,702	Santee Cooper
11. Lake Moultrie	\$8,642	\$3,457	\$0	\$5,185	Santee Cooper
12. Lake Murray	\$322,500	\$129,000	\$0	\$193,500	SCE&G, Lexington Co., Richland Co.
13. Lake Wateree	\$2,438	\$975	\$0	\$1,463	Duke Power
14. Little Pee Dee	\$6,298	\$2,519	\$0	\$3,779	Horry Co.
15. Pee Dee River	\$6,433	\$2,573	\$0	\$3,860	Georgetown Co.
16. Santee Coastal Reserve	\$24,162	\$0	\$0	\$24,162	Santee Coastal Reserve
17. Waccamaw River	\$6,433	\$2,573	\$0	\$3,860	Georgetown Co.
18. Charlestown Landing	\$1,200	\$0	\$0	\$1,200	SCPRT
19. Kings Mt. SP Lk. Crawford	\$2,000	\$0	\$0	\$2,000	SCPRT
20. Lee SP	\$120	\$0	\$0	\$120	SCPRT
21. Little Pee Dee SP	\$9,750	\$0	\$0	\$9,750	SCPRT
22. Paris Mountain SP	\$1,000	\$0	\$0	\$1,000	SCPRT
23. Santee SP (swimming lake)	\$750	\$0	\$0	\$750	SCPRT
24. Sesquicentennial SP	\$6,500	\$0	\$0	\$6,500	SCPRT
TOTAL	\$704,292	\$256,367	\$0	\$447,925	

NOTE:

Planned expenditures are based on anticipated aquatic plant problems.

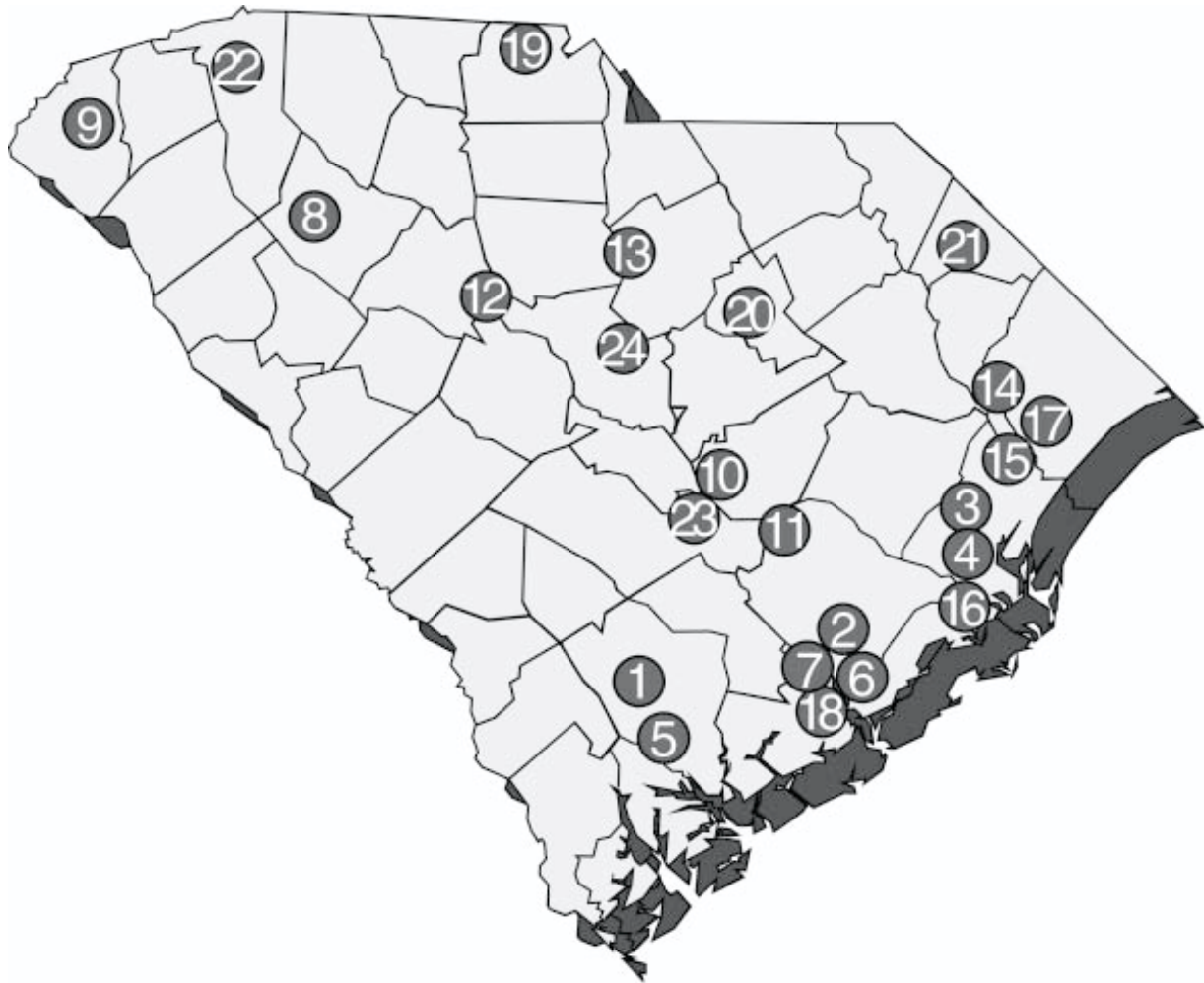
The extent of proposed management operations will be modified depending on actual aquatic plant growth and funding availability in 2003.

(Federal and local funding amounts are subject to change based on availability of Federal funds.)

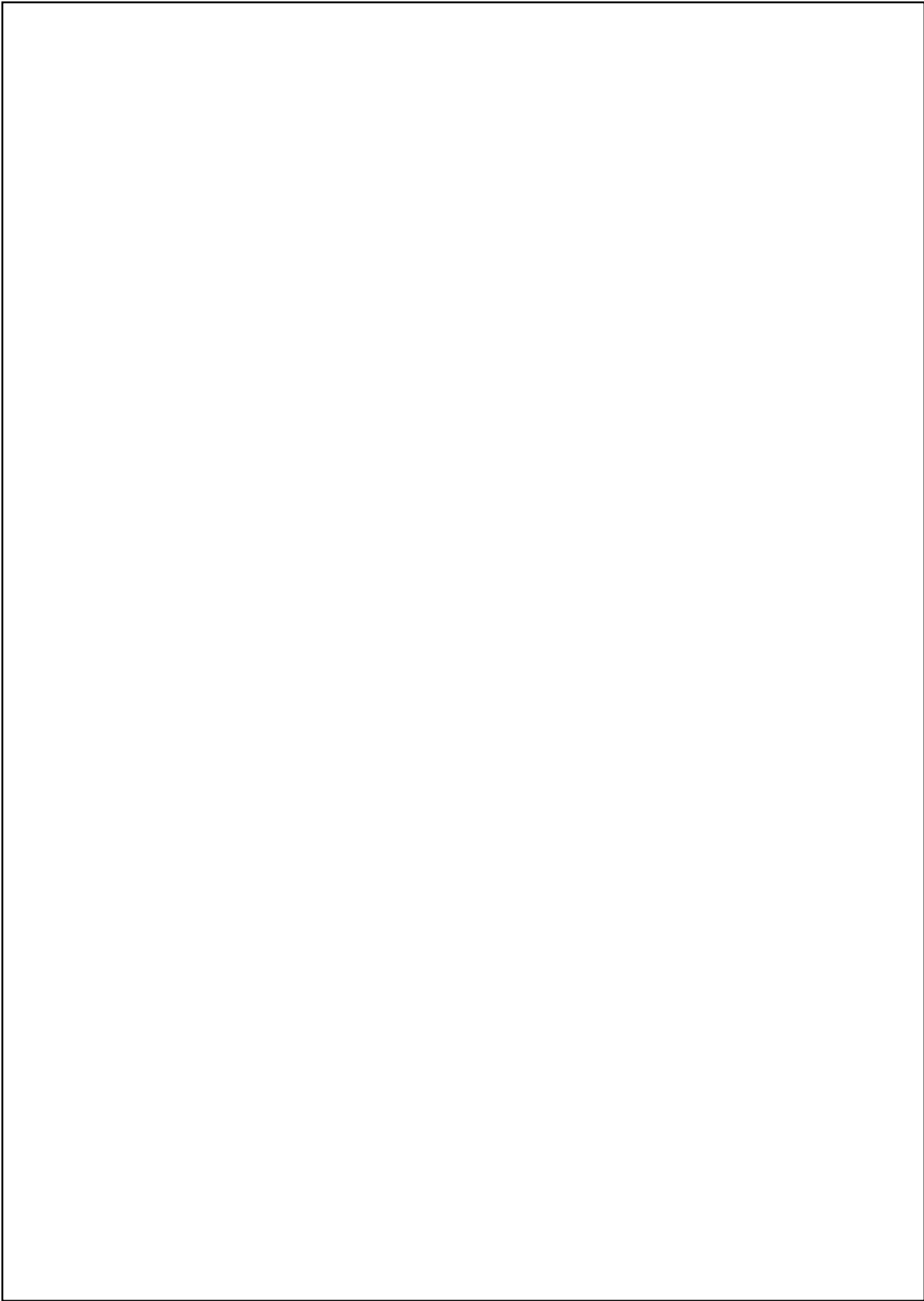
* Control operations on Lakes Marion and Moultrie may receive federal funds from the Corps of Engineers St. Stephen Plant if control activities are directly related to maintaining operation of the St. Stephen Hydropower Facility. Those funds should be used whenever possible instead of APC cost-share funds from the Charleston District.

** State appropriated funds may be used for operations after July 1 if received in FY 03.

Location of 2003 Management Sites



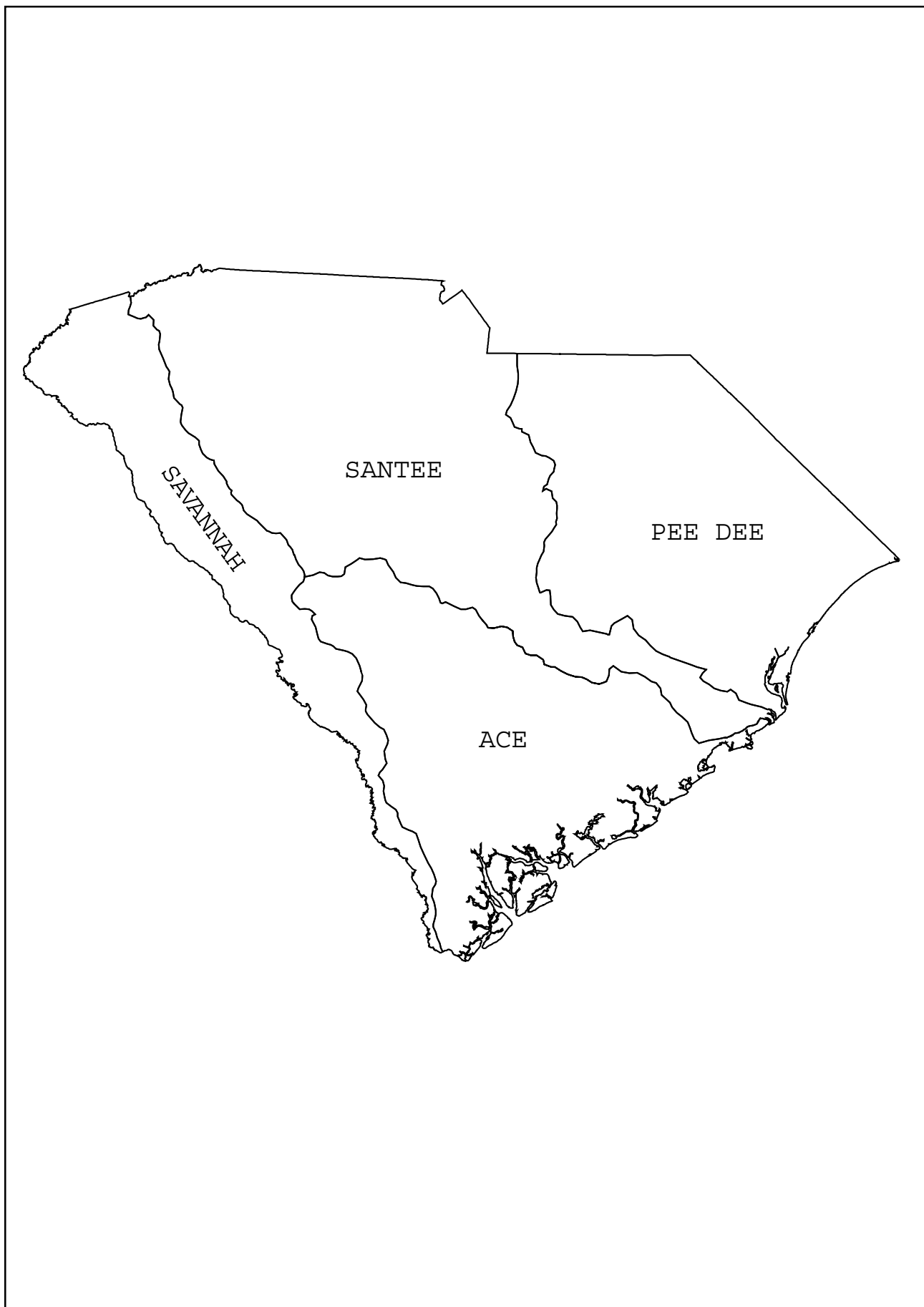
Appendices



APPENDIX A

Major River Basins

in South Carolina



APPENDIX B

Enabling Legislation

**South Carolina Code of Laws
Section 49-6-10/40**

Title 49 – Waters, Water Resources and Drainage

CHAPTER 6. AQUATIC PLANT MANAGEMENT

SECTION 49-6-10. Purpose; administering agency.

There is hereby created the South Carolina Aquatic Plant Management Program for the purpose of preventing, identifying, investigating, managing, and monitoring aquatic plant problems in public waters of South Carolina. The program will coordinate the receipt and distribution of available federal, state, and local funds for aquatic plant management activities and research in public waters.

The Department of Natural Resources (department) is designated as the state agency to administer the Aquatic Plant Management Program and to apply for and receive grants and loans from the federal government or such other public and private sources as may be available for the Aquatic Plant Management Program and to coordinate the expenditure of such funds.

SECTION 49-6-20. Aquatic Plant Management Trust Fund.

There is created the South Carolina Aquatic Plant Management Trust Fund which must be kept separate from other funds of the State. The fund must be administered by the department for the purpose of receiving and expending funds for the prevention, management, and research of aquatic plant problems in public waters of South Carolina. Unexpended balances, including interest derived from the fund, must be carried forward each year and used for the purposes specified above. The fund shall be subject to annual audit by the Office of the State Auditor.

The fund is eligible to receive appropriations of state general funds, federal funds, local government funds, and funds from private entities including donations, grants, loans, gifts, bond issues, receipts, securities, and other monetary instruments of value. All reimbursements for monies expended from this fund must be deposited in this fund.

SECTION 49-6-30. Aquatic Plant Management Council; membership; duties.

There is hereby established the South Carolina Aquatic Plant Management Council, hereinafter referred to as the council, which shall be composed of ten members as follows:

1. The council shall include one representative from each of the following agencies, to be appointed by the chief executive officer of each agency:

- (a) Water Resources Division of the Department of Natural Resources;
- (b) South Carolina Department of Health and Environmental Control;
- (c) Wildlife and Freshwater Fish Division of the Department of Natural Resources;
- (d) South Carolina Department of Agriculture;
- (e) Coastal Division of the Department of Health and Environmental Control;
- (f) South Carolina Public Service Authority;
- (g) Land Resources and Conservation Districts Division of the Department of Natural Resources;
- (h) South Carolina Department of Parks, Recreation and Tourism;
- (i) Clemson University, Department of Fertilizer and Pesticide Control.

2. The council shall include one representative from the Governor's Office, to be appointed by the Governor.

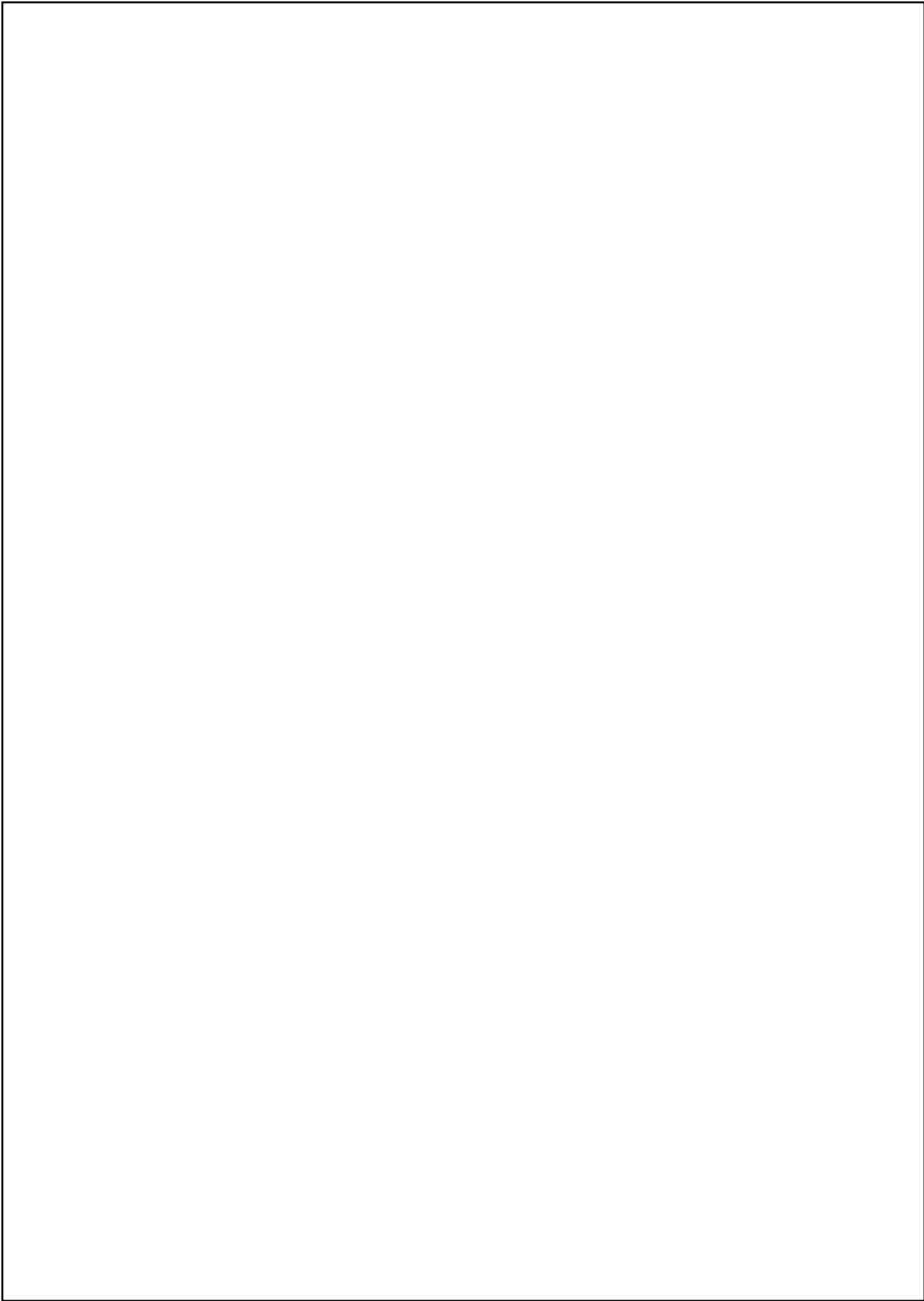
3. The representative of the Water Resources Division of the Department of Natural Resources shall serve as chairman of the council and shall be a voting member of the council.

The council shall provide interagency coordination and serve as the principal advisory body to the department on all aspects of aquatic plant management and research. The council shall establish management policies, approve all management plans, and advise the department on research priorities.

SECTION 49-6-40. Aquatic Plant Management Plan.

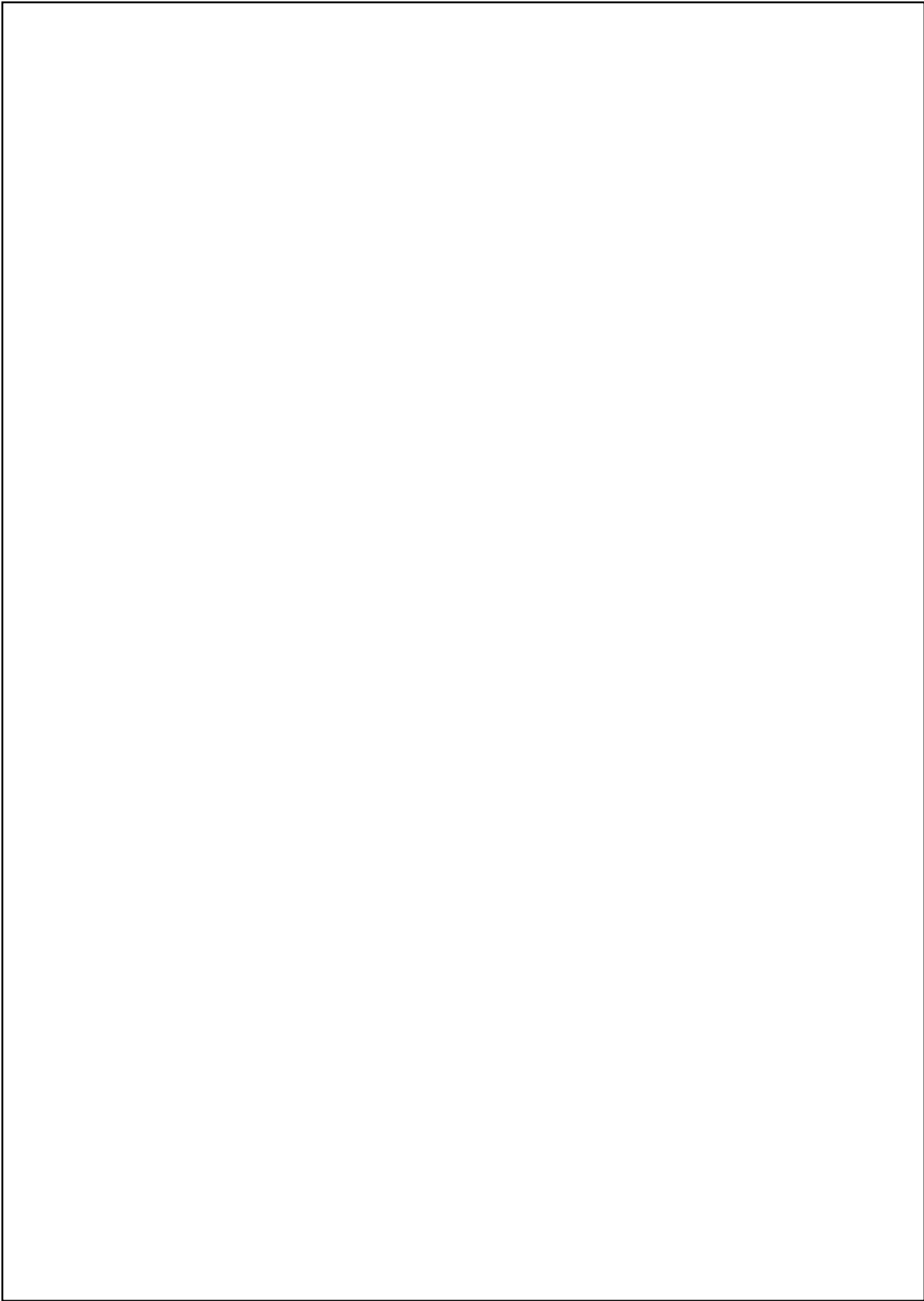
The department, with advice and assistance from the council, shall develop an Aquatic Plant Management Plan for the State of South Carolina. The plan shall describe the procedures for problem site identification and analysis, selection of control methods, operational program development, and implementation of operational strategies. The plan shall also identify problem areas, prescribe management practices, and set management priorities. The plan shall be updated and amended at appropriate intervals as necessary; provided, however, problem site identification and allocation of funding shall be conducted annually. In addition, the department shall establish procedures for public input into the plan and its amendments and priorities. The public review procedures shall be an integral part of the plan development process. When deemed appropriate, the department may seek the advice and counsel of persons and organizations from the private, public, or academic sectors.

The council shall review and approve all plans and amendments. Approval shall consist of a two-thirds vote of the members present. The department shall have final approval authority over those sections which do not receive two-thirds approval of the council.



APPENDIX C

Aquatic Plant Problem Identification Form



Aquatic Plant Problem Site Identification

1. Name and location of affected water body _____

2. Public or private water _____

3. Name of problem plant (if known) _____

4. Does the plant grow above or below the surface of the water? _____

5. Approximate area of water covered by the problem plant _____

6. Type of water use(s) affected by the plant _____

7. Length of time problem has existed _____

8. Plant control methods that have been used _____

9. Contact for additional information:

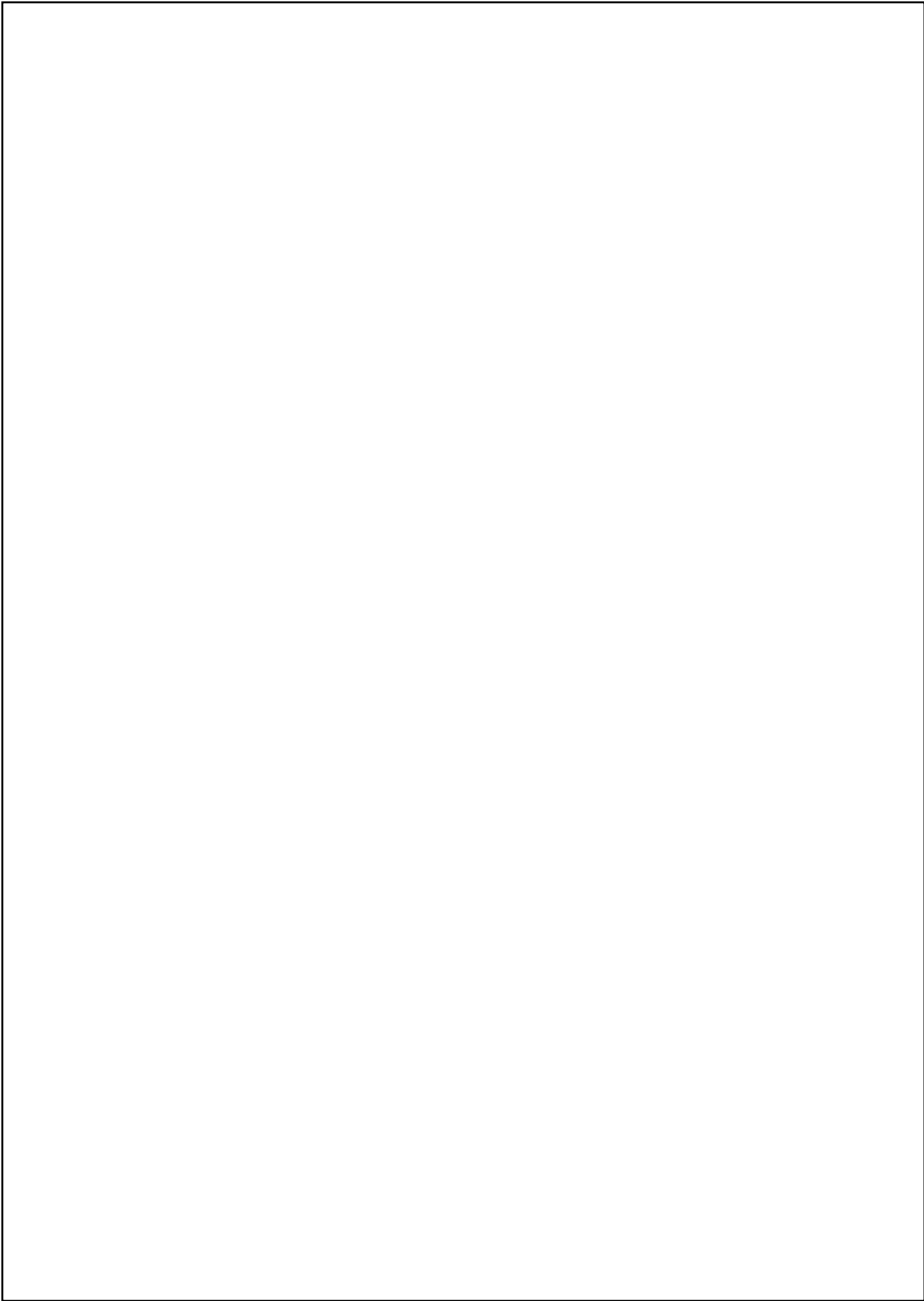
Name _____

Address _____

Phone _____

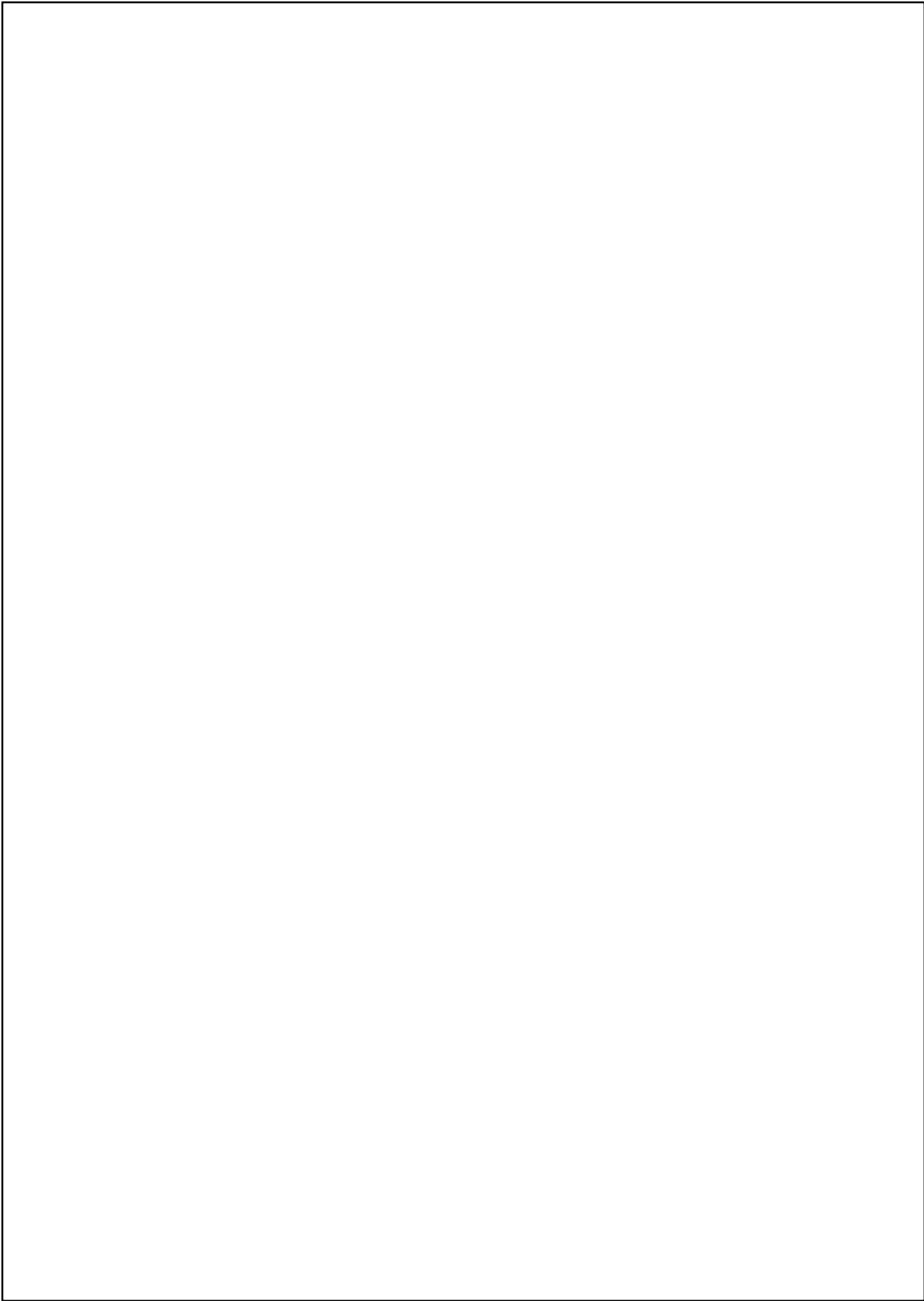
Please Return To: Chris Page
S.C. Department of Natural Resources
2221 Devine Street, Suite 222
Columbia, South Carolina 29205
(803) 755-2836

Please include a sample of the plant if possible. Wrap the plant in a moist towel and place in a "baggie". The sample should include flowers, if visible, along with leaf structure and stem.



APPENDIX D

Aquatic Plant Control Agents



Aquatic Plant Control Agents

Listed below are the major aquatic plant control agents which are currently available for use in South Carolina. While the list is not all inclusive, it does contain those agents considered most useful for aquatic plant management. Costs for the agents are approximations and will vary somewhat depending on the source and amount purchased. Application costs are approximations of commercial applicator rates.

I. Chemical Control

A. Diquat (Reward)

1. Target Plants
 - a. Submersed species - Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, and hydrilla.
 - b. Floating species - Pennywort, Salvinia, water hyacinth, water lettuce, and duckweed.
2. Application Rate
 - a. Submersed species - One to two gallons per surface acre.
 - b. Floating species - One half to one gallon per surface acre, depending on target species.
3. Cost - Diquat costs approximately \$93 per gallon. Assuming an application rate of two gallons per acre and an application cost of \$39 per acre, the total cost would be \$225 per acre per application for submersed species. The treatment cost for floating species at one-half gallon per acre rate would be \$86 per acre.
4. Use Considerations - Diquat is not toxic to fish or wildlife at normal use concentrations. It is non-volatile and nonflammable, but can cause irritation to eyes and skin upon contact. Its effectiveness is greatly reduced at temperatures below 50-60°F, by overcast conditions, and by turbid waters.
5. Water Use Restrictions - Water treated with Diquat cannot be used for drinking for up to 3 days, livestock consumption for one day, irrigation of food crops for 5 days, and irrigation of turf and ornamentals for up to 3 days depending on application rate or until approved analysis indicates that diquat ion concentrations are less than 0.02 ppm. There are no fishing or swimming restrictions. Do not apply this product within 1600 feet upstream of an operating water intake in flowing water bodies (rivers, streams, canals) or within 400 feet of an operating water intake in standing water bodies (lakes, reservoirs). To make applications within these restricted areas, the intake must be turned off for the time periods specified on the Federal label for the appropriate use category (Drinking, Livestock consumption, Irrigation) or until the treated area contains less than 0.02 ppm of diquat dibromide.

B. 2,4-D (Aqua-Kleen, Navigate)

1. Target Plants

- a. Emergent species - Broadleaf species such as water primrose, waterlily, cowlily, watershield, smartweed, pondweeds, and floating heart.
- b. Submersed species - Watermilfoil, bladderwort, and coontail.
- c. Floating species - Water hyacinth.

2. Application Rate

- a. Granular form (2,4-D BEE) - 150 to 200 pounds per acre depending on target species.
- b. Liquid form - (2,4-D DMA) - 4 3/4 pints in 50 to 100 gallons of water per acre.

3. Cost

- a. The granular form of 2,4-D costs about \$2.07 per pound. Assuming an application rate of 150 pounds per acre and an application cost of \$55 per acre, the total cost would be \$365 per application.
- b. The liquid form of 2,4-D costs approximately \$11.50 per gallon. Assuming an application rate of 4 3/4 pints per acre and an application cost of \$39 per acre, the total cost would be \$46 per acre per application.

4. Use Considerations - The recommended formulations of 2,4-D are not toxic to fish or wildlife at normal use concentrations. This chemical is nonflammable and noncorrosive.
5. Water use Restrictions - Do not apply to waters used for irrigation, agricultural sprays, watering dairy animals, or domestic water supplies.

C. Chelated Copper (Cutrine Plus, Clearigate, Komeen, K-TEA, Nautique, Captain)

1. Target Plants

- a. Algae - Cutrine Plus, K-TEA, Captain
- b. Submersed species (Hydrilla, Brazilian elodea, pondweed and southern naiad) - Komeen, Nautique, Cutrine Plus, Clearigate, and Captain

2. Application Rate

- a. Algae - Treatment concentration of 0.2-0.5 parts per million of copper.
- b. Submersed species - 1.0 part per million of copper (12-16 gallons per acre) or mix two gallons of copper complex and two gallons of diquat per acre.

3. Cost - Copper products cost about \$11.50 per gallon. Assuming an application rate of 16 gallons per acre and an application cost of \$39 per acre, the total cost would be \$223 per acre.

4. Use Considerations - Copper may be toxic to fish and aquatic invertebrates at recommended application rates, especially in soft water. Copper-based products should be carefully applied and monitored to minimize the risk of fish kills.

5. Water Use Restrictions - Copper complexes may be used in domestic and irrigation water supplies without water use restrictions.
- D. Endothall - (Aquathol, Aquathol K, Aquathol Super K granular, Hydrothol 191 granular and liquid)
 1. Target Plants

Aquathol products are effective for submersed species such as naiads, bladderwort, coontail, watermilfoil, pondweed, hydrilla, and cabomba.

Hydrothol 191 is effective on the species listed above as well as filamentous and macrophytic algae.
 2. Application Rate

Aquathol

 - a. Liquid form (Aquathol K) - three gallons or more per acre depending on the target species.
 - b. Granular form -
Aquathol: 54-323 pounds per acre depending on water depth and the target species.

Aquathol Super K: 22-66 pounds per acre depending on the water depth and the target species.

Hydrothol 191

 - a. Heavy Infestations - Evenly spread 160 - 270 pounds per acre foot of water (3.0 - 5.0 ppm) applied evenly.
 - b. Moderate or light infestations - Use 55 - 110 pounds per acre foot (1.0 - 2.0 ppm) applied evenly.
 3. Cost

Aquathol

 - a. Aquathol K costs approximately \$47 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of \$39 per acre, the total cost would be \$274 per acre.
 - b. Aquathol granular costs about \$2.25 per pound. At an application rate of 150 pounds per acre and an application cost of \$55 per acre, the total cost would be \$393 per acre per application.
 - c. Aquathol Super K costs about \$13.00 per pound at an application rate of 30 pounds per acre and an application cost of \$55 per acre, the total cost would be \$445 per acre.

Hydrothol 191

Hydrothol 191 granular costs approximately \$2.25 per pound. Assuming an application rate of 240 pounds per acre and an application cost of \$55, the total cost would be \$595 per acre.

4. Use Considerations - Concentrated endothall formulations are toxic to man if ingested or absorbed through the skin. They are also irritating to the skin and eyes. Avoid contact with or drift to other crops or plants as injury may result. Generally not toxic to fish at normal use concentrations, however, fish may be killed by dosages of Hydrothol 191 in excess of 0.3 ppm.
5. Water Use Restrictions - Water treated with endothall cannot be used for watering livestock, preparing agricultural sprays for food crops, for irrigation or domestic purposes for 7 to 25 days after treatment (depending on treatment concentration) or until such time that the water does not contain more than 0.2 ppm of endothall. Do not use fish from treated areas for feed or food for three days after treatment.

E. Glyphosate (Rodeo, Eagle, Aquastar)

1. Target Plants - Emergent broadleaf plants and grasses such as alligatorweed, water primrose, smartweed, and *Phragmites*.
2. Application Rate - Up to 7 1/2 pints per acre, the specific rate depending on the target species.
3. Cost - Glyphosate products range in price from \$47-\$77 per gallon. At an application rate of 7.5 pints per acre and an application cost of \$39 per acre, the total would range from \$83-\$111 per acre per application.
4. Use Considerations - Glyphosate is not toxic to mammals, birds or fish at recommended use concentrations. Glyphosate products with aquatic labels can be used in and around aquatic sites, including all bodies of fresh and brackish water which may be flowing or nonflowing.
5. Water Use Restrictions - Do not apply within 0.5 miles upstream of potable water intakes unless water intake is shut off for 48 hours. There are no restrictions on water use for irrigation or recreation after treatment.

F. Fluridone (Sonar, Avast)

1. Target Plants - Primarily submersed plants, such as hydrilla, Brazilian elodea, watermilfoil, pondweeds, duckweeds and naiads; also effective on lilies and some grasses.
2. Application Rate
 - a. Liquid form (Sonar AS, Avast) - 0.12 to 2.44 quarts per acre depending on water depth.

- b. Pellet forms (Sonar PR, Sonar SRP, Avast SRG) - 15 to 80 pounds per acre depending on water depth.
 - 3. Cost
 - a. The liquid formulation ranges from \$1200-\$1500 per gallon. Assuming an application rate of 2 quarts per acre (2 pounds active ingredient per acre) and an application cost of \$39 per acre, the total cost would be \$639 per acre per application.
 - b. The pellet formulations range in price from \$21.00-\$25.00 per pound. Assuming an application rate of 40 pounds per acre (2 pounds active ingredient per acre) and an application cost of \$55 per acre, the total cost would be \$895 per acre per application.
 - 4. Use Considerations - In large lakes and reservoirs fluridone should be applied to areas greater than five acres. This herbicide requires a long contact time and is not effective in sites with significant water movement or rapid dilution. Fluridone is slow acting and may require 30 to 90 days to achieve desired control under optimal conditions. Unlike other aquatic herbicides, fluridone has proven effective in inhibiting viable hydrilla tuber production.
 - 5. Water Use Restrictions - Do not apply within 1/4 mile of a functioning potable water intake unless concentrations are less than 20 ppb. Water treated with fluridone cannot be used for irrigation for 7-30 days depending on target crop.
- G. Imazapyr (Arsenal with *Experimental Use Permit only*)
 - 1. Target Plants - Phragmites, Alligatorweed, and water primrose.
 - 2. Application Rate - 16-48oz. per acre depending on target species.
 - 3. Cost - Arsenal costs \$270 per gallon. Assuming the application rate of 16 oz per acre and an application cost of \$39 per acre, the total cost would be \$73 per acre.
 - 4. Use Considerations - Arsenal currently does not have an approved aquatic label so is intended for use by governmental agencies only by Experimental Use Permit.
 - 5. Water Use Restrictions - Do not apply within 1/2 mile of potable water or irrigation water intakes. Do not treat water intended for consumption by humans or livestock. Do not treat water used for commercial production of fish or other aquatic organisms.
- H. Triclopyr (Renovate 3, Tahoe)
 - 1. Target Plants - Alligatorweed, Eurasian watermilfoil, water hyacinth, parrotfeather, and water primrose.

2. Application Rate - 2-8 qts. per acre depending on target species.
3. Cost - Triclopyr products cost \$93 per gallon. Assuming the application rate of 2 qts per acre and an application cost of \$39 per acre, the total cost would be \$86 per acre.
4. Use Considerations - Triclopyr is not toxic to fish or wildlife at normal use concentrations. It can cause severe irritation to eyes and skin upon contact. Its is suggested it is used in a manner to reduce the possibility of drift. The proper personal protective equipment should be used as prescribed by the Federal label.
5. Water Use Restrictions - For floating and emergent applications do not apply within 200 feet of potable water intakes when using 4 - 8 qts per acre. To make applications within these restricted areas, follow the label directions. There are no restrictions on the use of treated water for recreational purposes or for livestock consumption.

II. Biological Control

A. Alligatorweed Flea Beetle (*Agasicles hygrophila*)

1. Target Plant - Alligatorweed
2. Stocking Rate - 600-1,000 per acre.
3. Cost - The U.S. Army Corps of Engineers office in Palatka, Florida will provide lots of 6,000 flea beetles for the cost of shipping which is about \$50 per shipment. Flea beetles may also be obtained from the U.S. Department of Agriculture.
4. Use Considerations - Flea beetles feed only on alligatorweed and pose no threat to desirable plant species. They produce no adverse impact on the aquatic environment. As with all biological control agents, flea beetles may not remain in the area where stocked but may migrate to other areas of alligatorweed infestation. These insects are not able to survive severe winters and may require occasional restocking. The effectiveness of these insects may be enhanced by use with an aquatic herbicide such as 2,4-D, or Rodeo.

B. Alligatorweed Stem Borer Moth (*Vogtia malloi*)

1. Target Plant - Alligatorweed
2. Cost - Approximately the same as for flea beetle.
3. Use Considerations - Same as for flea beetle.

C. Alligatorweed Thrip (*Amynothrips andersonii*) - This insect feeds on alligatorweed and has been stocked in South Carolina. It has failed to become established in the

State and is considered less desirable than flea beetles or stem borers for control of alligatorweed.

- D. Triploid White Amur or grass carp (*Ctenopharyngodon idella*)
 - 1. Target Plant - Primarily submersed plants including Brazilian elodea, hydrilla, bladderwort, coontail, naiads, pondweeds.
 - 2. Cost - Triploid white amur cost \$4 to \$7 each. At a stocking rate of 15 to 25 fish per vegetated acre, the total cost could range from \$60 to \$175 per acre.
 - 3. Use Considerations - Only the triploid (sterile) white amur may be stocked in South Carolina for aquatic weed control. Introduction and stocking of this fish is regulated by the S.C. Department of Natural Resources. Escapement over some dams may occur during high flow periods. Use of barriers in some lakes should prevent fish loss. While grass carp are effective on a wide variety of submersed plants, they generally do not provide effective control of watermilfoil species. Plants should be carefully identified prior to stocking to ensure proper stocking rates and potential efficacy.
- E. Tilapia (*Tilapia sp.*) - Several species of this herbivorous fish have been used to control filamentous algae and submersed macrophytes. Tilapia cannot overwinter in South Carolina.

Introduction of fish is regulated by the S.C. Department of Natural Resources.

III. Mechanical Control

- A. Harvesters, Cutters, Dredges and Draglines
 - 1. Target Plants - All species
 - 2. Cost - Harvesters range in cost from \$5,000 to over \$150,000 for the initial investment. Operating cost range from \$300 to \$700 per acre.
 - 3. Use Consideration - Harvesters can be used in irrigation and drinking water supplies without water use restrictions. They may actually spread some plants such as Brazilian elodea and hydrilla by dispersing plant fragments which form new colonies. Harvesting requires the availability of a land disposal site for harvested plants. These devices cannot be used on water bodies which have debris and obstructions which interfere with operation. Harvesters are slow, with a maximum coverage of about five acres per day.
- B. Fiberglass Bottom Screens
 - 1. Target Plants - All species which root in the bottom.
 - 2. Cost \$10,000 per acre.

3. Use Considerations - Bottom screens may be detrimental to bottom-dwelling aquatic organisms. Due to high cost, use is usually restricted to beaches and other swimming areas where a relatively small area of control is required.

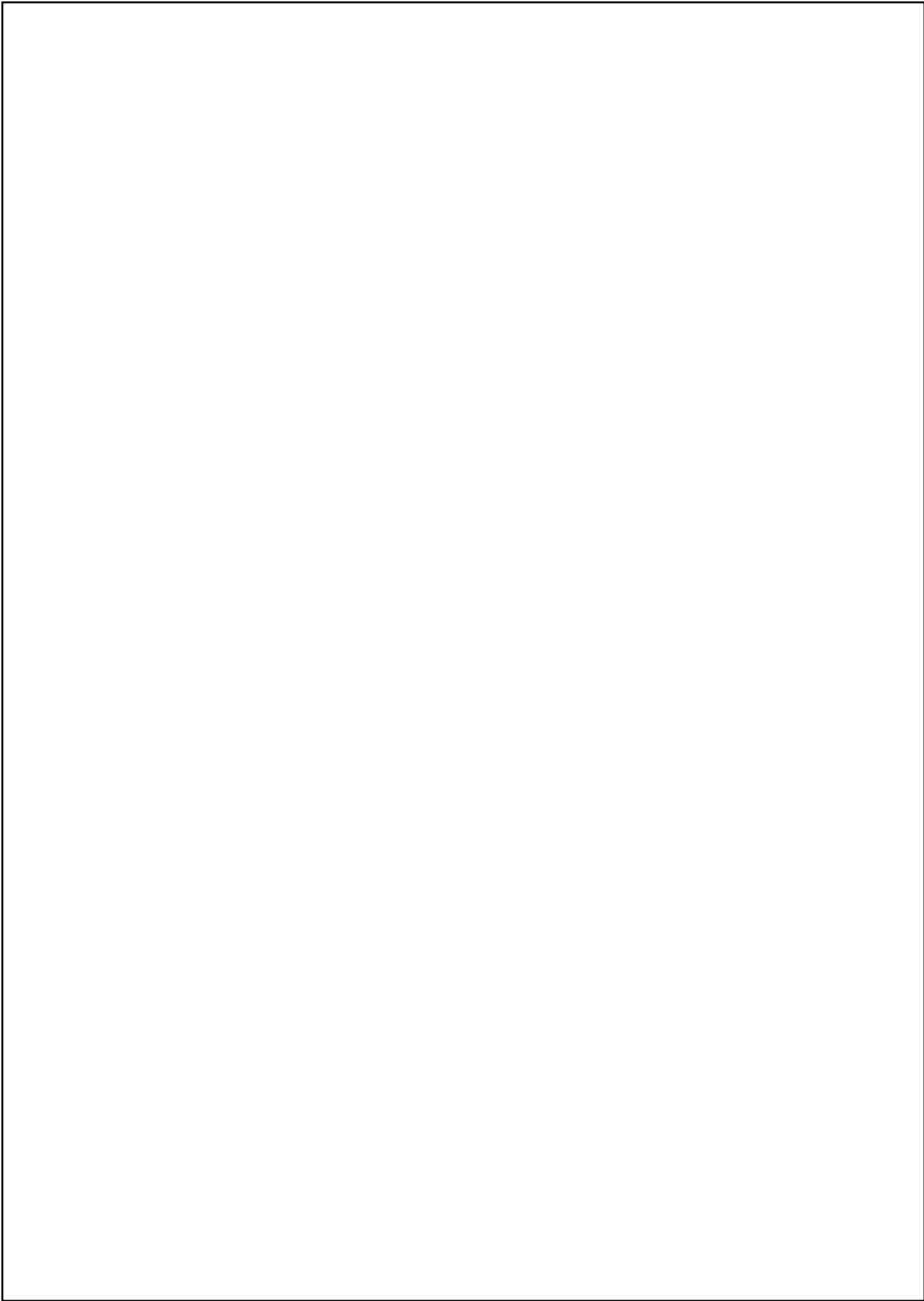
IV. Environmental Alterations

- A. Water Level Manipulation - Some species of aquatic plants can be controlled by a periodic raising or lowering of water level. Shoreline grasses, cattails, and *Phragmites* can be controlled, to some extent, by maintaining higher than normal water levels during the plant growing season. Periodic lowering of water and drying of the bottom can reduce abundance of a number of submersed and emersed species. Disadvantages are that water level fluctuation can adversely affect water uses such as recreation, hydroelectric power production, wildlife protection, and others. Also, some plant species may actually be favored by water level variations. Many factors must be considered before using this method for aquatic plant control.
- B. Reduction in Sedimentation and Nutrient Loading - Sedimentation decreases depth of the water body and increased the area where aquatic plants can grow. Nutrient enrichment resulting from man's activities usually does not create aquatic plant problems, but does contribute to existing problems. Reduction in these two environmental factors can assist in aquatic plant management, but is not a sufficient control method by itself. The mechanism for control of these factors is through implementation of Best Management Practices for Control of Non-Point Source Pollution developed by the S.C. Department of Health and Environmental Control, and through the wastewater discharge permitting program also administered by the S.C. Department of Health and Environmental

(NPDES)
Control.

APPENDIX E

SCDNR and Santee Cooper Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes



**S.C. Department of Natural Resources and Santee Cooper
Aquatic Plant and Habitat Management Goals
For the Santee Cooper Lakes**

Santee Cooper (S-C) and the S.C. Department of Natural Resources (DNR) recognize the Santee Cooper Lakes as a significant natural resource of the State. In order to provide balanced benefits to natural resources and the multiple uses of the lakes, the DNR and S-C (the parties) agree to cooperate in the management of aquatic vegetation and the habitat that it provides. The parties' goal is to maintain 10 % of the lakes' surface area as beneficial vegetated habitat for waterfowl, wildlife, fish and other aquatic organisms. In order to achieve this goal, the parties agree to the following:

1. The aquatic plant management goal for the Santee Cooper Lakes is to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species. The aquatic plant coverage should include a combination of submersed, floating leaf, and emergent plant species that provide habitat and food to game and non-game fish and wildlife species. At least 75% of the vegetation should be composed of species that are beneficial to waterfowl. This vegetation should be distributed throughout the lake system. However, localized control using chemical or mechanical methods may be necessary in areas where vegetation interferes with hydroelectric power production or other legitimate lake uses regardless of plant coverage and distribution.

2. Monitoring

Aquatic Plants: S-C will annually monitor the vegetative community and extent of coverage. This monitoring may include aerial photography, visual surveys, hydro-acoustic transects and other appropriate measures - as deemed necessary by the parties in the annual work plan - to map the plant species and coverage. An annual report of the monitoring results will be completed at the end of each growing season and provided to the parties prior to preparation of the following year's work plan.

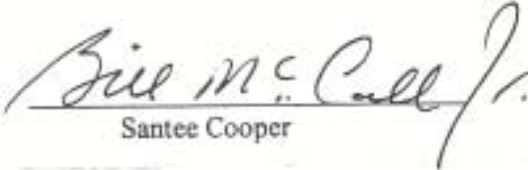
Fish and Wildlife: The DNR and Santee Cooper will cooperate in monitoring the health of the fishery and in conducting enhanced monitoring of waterfowl populations. The waterfowl population monitoring will consist of aerial waterfowl censuses. The census will be conducted 10 times each winter. The DNR will provide personnel and prepare an annual report to be distributed to both agencies. S-C will provide the flight time, approximately 30 hours each year.


3. Sterile grass carp will continue to be a major component of the long-term management strategy in controlling hydrilla. The DNR and S-C will meet at least annually to review the monitoring data and to develop recommendations for maintenance stocking levels and other control strategies. These recommendations will be jointly presented to the Aquatic Plant Management Council for consideration. The implementation of these recommendations will be subject to approval by the Council.

4. Aquatic vegetation will not be controlled in Santee Cooper Project water bodies that are totally isolated from the lakes unless it conflicts with specific water uses or is identified as a state or federal noxious weed and poses a threat to Lakes Marion and Moultrie.

5. In order to enhance native plant growth and habitat throughout the lake system, S-C and the DNR will cooperate in implementing innovative management techniques. These techniques could include such measures as constructing grass carp barriers, introducing desirable native plant species, enhancing wildlife/waterfowl management areas, and implementing strategic lake level management measures.

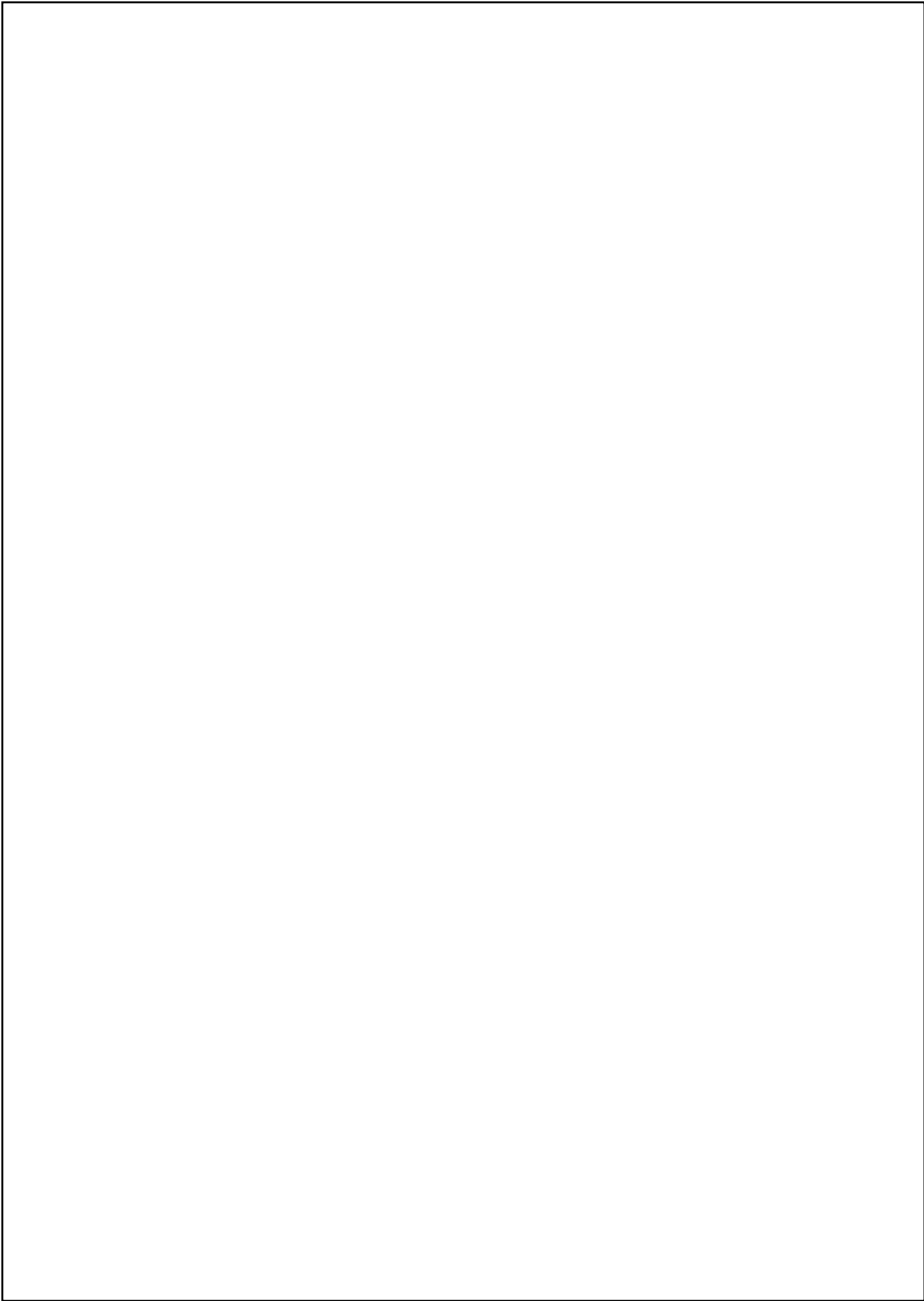
6. The DNR and S-C will meet annually to review the results of the monitoring and treatment programs to determine the effectiveness of the programs, and to develop annual work plans. Every five years the parties will meet to conduct a comprehensive review of the programs and to determine the success in meeting the overall management goals. Based upon this review, the provisions of this agreement may be modified, as deemed appropriate, by the mutual consent of the parties.


Santee Cooper


SCDNR

APPENDIX F

Summary of Aquatic Plant Control Expenditures



SUMMARY OF AQUATIC PLANT CONTROL EXPENDITURES

During 1981, the Council received \$60,000 in Federal matching funds through the U.S. Army Corps of Engineers. The Council allocated \$57,000 of these funds to the S.C. Public Service Authority for plant management at Lake Marion. The Authority used these funds to chemically treat approximately 500 acres of the area uplake of the Rimini railroad trestle. The herbicide diquat was used to treat for Brazilian elodea and other submersed weed species. The remainder of the Federal funds were used to assist in development of the Council's management program.

During 1982, \$30,000 in Federal funds were allocated to the S.C. Public Service Authority for control of hydrilla and other nuisance plants at Lake Marion. An additional \$13,500 were allocated to Berkeley County for control of water hyacinths at Goose Creek Reservoir.

During 1983, \$155,000 in Federal matching funds were allocated to the S.C. Public Service Authority for plant control at Lake Marion. These funds were used to treat approximately 1,400 acres of upper Lake Marion with diquat, endothall and fluridone for control of Brazilian elodea, hydrilla and other submersed plants. The Council also provided \$4,500 in Federal matching funds to Berkeley County for maintenance control of water hyacinths at Goose Creek Reservoir.

During 1984, \$249,500 in Federal funds and \$40,500 in State funds were allocated to the S.C. Public Service Authority for aquatic weed control at Lake Marion. The S.C. Electric and Gas Company was allocated \$25,000 for control of hydrilla and other submersed aquatic weeds at Back River Reservoir. Berkeley County was allocated \$5,000 for maintenance control of water hyacinth at Goose Creek Reservoir.

Calendar year 1985 represented the first year of significant funding for aquatic plant management in South Carolina since the establishment of the Aquatic Plant Management Program in 1980. Funding was available from State and Federal sources over separate fiscal years. A total expenditure of \$701,349 was used to control nuisance aquatic plant populations on 29 water bodies around the State. Of this expenditure, \$98,377 was used for biological control by triploid grass carp and \$602,972 was used for chemical control operations.

During 1986, a mild winter coupled with low lake levels and clear water due to a severe drought resulted in an abundance of submersed aquatic plants. Hydrilla populations in Lake Marion and Back River Reservoir increased in coverage and new populations were discovered in the Cooper River ricefields. A total of 38 water bodies (4,925 acres) were managed for aquatic weeds at a cost of \$704,090. Herbicide applications were made on 33 lakes (4,441 acres) at a cost of \$673,979. Biological controls were implemented on nine water bodies around the State at a cost of \$30,111.

During 1987, a total of \$604,695 in State and Federal funds were expended for aquatic weed control in public waters. Chemical control work amounting to \$599,445 was conducted in 26 public water bodies. Biological control, including stocking triploid grass carp and alligatorweed flea beetles, was conducted at eight water bodies for a total expenditure of \$5,250.

During 1988, a total of \$631,164 in State, Federal, and local funds were expended for aquatic plant control activities in 25 water bodies. Because of reductions in the amount of Federal match from 70 percent to 50 percent of total control cost, local sponsors were for the first time required to provide at least 15 percent of control costs. Approved aquatic herbicides were applied to 3,258 acres on 21 water bodies at a total cost of \$583,764. Biological controls were implemented on four water bodies at a cost of \$47,400.

During 1989, a total of \$827,630 in Federal, State, and local funds were expended for aquatic plant control operations in 23 water bodies. Aquatic herbicides were applied to 2620 acres on 21 water bodies at a cost of \$422,009. A three year triploid grass carp stocking project was initiated on Lake Marion with the release of 100,000 sterile grass carp. Because this represents the largest such stocking in the country to date, biological control expenditures were substantially higher than in previous years, totaling \$405,621.

During 1990, a total of \$944,194 were expended for aquatic plant control activities on 24 water bodies. Herbicide treatments were made to all water bodies (2850 acres) at a cost of \$524,194. Lake Marion received its second installment of 100,000 triploid grass carp at a cost of \$420,000. Because of limited federal funds and a substantial increase in local funds (primarily from Santee Cooper), this was the first year that there were insufficient federal funds available to match all planned control operations. The Corps of Engineers provided 47 percent of total funding, while state and local entities provided 16 percent and 37 percent, respectively.

In 1991, aquatic plant management operations were conducted on 18 public water bodies at a total cost of \$1,965,387. The exceptionally large expenditure was a result of emergency control operations to alleviate blockage of the St. Stephen Hydroelectric facility on Lake Moultrie by hydrilla. A record high 6838 acres was treated with aquatic herbicides at a cost of \$1,505,771. Biological control agents were used on five lakes at a cost of \$459,615. Most of this included the third stocking of triploid grass carp in upper Lake Marion. While 50 percent of program funding was provided by the U.S. Army Corps of Engineers, 9 percent was provided by the State and 41 percent by local entities.

In 1992, 22 water bodies received control operations at a total cost of \$1,859,709. While last year's expenditures were higher, over 1,000 acres were treated by Santee Cooper at a cost of over \$200,000 but were not cost shared through the State program. Fifty percent of funding was provided by the U.S. Army Corps of Engineers, 8 percent by the State, and 42 percent by local entities. About 6,888 acres were treated with aquatic herbicide at a cost of \$1,447,864. Biological control agents (sterile grass carp and Tilapia) were introduced to six water bodies at a cost of \$411,845. This was the first year in which widespread hydrilla control was evident in upper Lake Marion from the grass carp. Hydrilla was controlled in over 6,500 acres in Stumphole, Low Falls, Elliotts Flats, and tree line areas. Compared to 1990 coverage, this represents an 80 percent reduction.

During 1993, a total of \$2,050,736 were expended for aquatic plant control activities on 27 water bodies. Forty-six percent of the funding was provided by the U.S. Army Corps of Engineers, 5 percent by the Department of Natural Resources, and 49 percent by various local sponsors. Aquatic herbicide treatments were made on 23 water bodies (8,125 acres) at a total cost of \$1,828,335. Biological control agents (grass carp and tilapia) were used on 11 lakes at a cost of \$222,400. Grass

carp stocked in upper Lake Marion in 1989-92 provided control (over 9,000 acres) for the second consecutive year. As a result of this success, stocking efforts were initiated in Lake Moultrie with the release of 50,000 grass carp. Hydrilla was discovered in Lake Murray this year resulting in unplanned treatment operations at several boat ramps and swimming beaches.

During 1994, aquatic plant management operations were conducted on 28 water bodies at a total cost of \$2,876,763. The U.S. Army Corps of Engineers provided 50 percent of all funds, while the State provided 7 percent and local entities provided 43 percent. Aquatic herbicide treatments were conducted on all water bodies (9,090 acres) at a cost of \$2,370,025. Grass carp were stocked in five lakes to control 10,242 acres at a cost of \$506,738. Lake Moultrie received the most grass carp (150,000 fish) to help increase the number of fish to target levels. Grass carp continue to control over 9,000 acres in upper Lake Marion for the third straight year. This year hydrilla was found in Lake Wateree for the first time resulting in unplanned treatments to attempt to eliminate it.

In 1995, a total of \$2,804,206 were expended for aquatic plant control activities on 30 water bodies. Fifty percent of the funding was provided by the U.S. Army Corps of Engineers, 44 percent was provided by local sponsors, and the state contributed 6 percent. Some level of herbicide treatment occurred on all the water bodies totalling about 9,710 acres at a cost of \$2,367,622. A total of 97,526 grass carp were stocked in five lakes at a total cost of \$435,084. Most of these were stocked in the Santee Cooper lakes (91,000) and Goose Creek Reservoir (6,000). Hydrilla was found in Lake Keowee for the first time this year which resulted in an unplanned treatment. Also *Salvinia molesta*, a federal noxious weed, was discovered in a private pond in Colleton County. Efforts were made to eradicate the infestation with treatments by the landowner and the state. Grass carp continue to provide excellent control in over 9,000 acres in upper Lake Marion; however, floating water hyacinths now infest much of this area impacting primarily shoreline and swamp areas.

Control expenditures in 1996 were about one-half of those in 1995 due in part to successful results from control efforts in previous years and in part to reductions in federal funding. A total of 19 water bodies were managed for nuisance species at a total cost of \$1,151,501; the Corps of Engineers provided 31%, the State provided 10%, and local entities provided 59%. Herbicide treatments were conducted in 4,920 acres at a cost of \$888,685; biocontrol agents were used in four lakes at a cost of \$262,816. Hydrilla coverage on the Santee Cooper lakes (Lakes Marion and Moultrie) declined by almost 80% due apparently to the successful stocking of sterile grass carp. As a result, herbicide treatments of hydrilla were reduced by a comparable amount. Hydrilla coverage has been essentially eliminated on Lake Wateree and substantially reduced on Lake Keowee through a combination of herbicide treatments and drawdowns. A large drawdown and treatment on Lake Murray this year is hoped to have similar results.

During 1997, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$459,783. This represents a 60% reduction from control costs in 1996 due to very successful hydrilla management efforts on the Santee Cooper lakes and Lake Murray coupled with limited Federal matching funds. Matching funds from the Corps of Engineers composed only 2 percent of total costs, while State and Local funds made up 38 percent and 60 percent, respectively. Sterile grass carp were stocked in five lakes to control 292 acres of submersed plants at a cost of \$15,951. Aquatic herbicides were used to treat 3,762 acres at a total cost of \$443,832. Most herbicide

treatments (58%, 2,181 acres) were focused on water hyacinth which has expanded its range and now is found on six major water bodies. Water hyacinth treatments on the Ashepoo River were greater than originally planned and treatments on the Waccamaw River were unanticipated. Hydrilla coverage on the Santee Cooper lakes continued to decline in 1997 due to successful control by sterile grass carp resulting in sharp reductions in management expenditures. The drawdown and herbicide treatment on Lake Murray in 1996 resulted in better than anticipated hydrilla control this year. Hydrilla acreage was reduced 88 percent with a 45 percent reduction in shoreline miles.

Limited hydrilla coverage on the Santee Cooper Lakes, Lake Murray and Goose Creek Reservoir during 1998 helped reduce overall control expenditures for the third consecutive year. Total control cost for 1998 were 40% less than in 1997. A total of 1,862 acres on 17 water bodies were managed at a cost of \$273,223. The Department of Natural Resources provided 47% of total funding, while 25% was provided by the Corps of Engineers, and 28% by various local entities. Sterile grass carp are effectively controlling hydrilla growth in the Santee Cooper Lakes and Goose Creek Reservoir. About one-half of all herbicide treatments (940 ac.) were focused on water hyacinth control on coastal rivers and impoundments.

A total of 3,259 acres on 19 water bodies were managed in 1999 at a total cost of \$453,071. Funding support was 34% State (SCDNR), 21% Federal (USCOE), and 45% local match. Most herbicide treatments (1506 acres, 46%) were directed at controlling the growth of water hyacinth in seven water bodies. Hydrilla growth remains limited statewide due to control operations in previous years. Grass carp in the Santee Cooper Lakes (Lakes Marion and Moultrie) and Goose Creek Reservoir are effectively controlling hydrilla growth in those lakes. Hydrilla regrowth was evident in Lake Murray at the end of the year; however, higher than normal lake levels restricted herbicide treatments. Therefore, significant regrowth is expected next year.

During 2000, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$483,236. State budget cuts at the end of the calendar year reduced control efforts by 21% of planned expenditures and shifted costs to local sponsors. Seventy percent of total costs were borne by local entities with the state paying the rest. Most of the control effort was focused on water hyacinth (31%), followed by hydrilla (25%) and Pithophora (19%). Hydrilla regrowth was significant on Lake Murray as predicted. Grass carp continue to control hydrilla on Goose Creek Reservoir and Lake Marion and Lake Moultrie.

During 2001, aquatic plant management operations were conducted on 2,775 acres on 25 water bodies at a total cost of \$508,075. Due to State budget cuts virtually all control costs were paid for with federal (41%) and local funds (59%). Hydrilla treatments were up this year (1,550 acres) because of a resurgence of hydrilla growth on Lake Murray; however, water hyacinth treatments were especially low (186 acres) due to a very cold period in December. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

During 2002, aquatic plant management operations were conducted on 2,239 acres on 17 water bodies at a total cost of \$297,236. Due to State budget cuts virtually all control costs were paid for with federal (37%) and local funds (63%). Water hyacinth treatments were up this year (1,186 acres) because of a milder than normal winter; however, hydrilla treatments were especially low (390 acres) due to the inability to treat Lake Murray. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

Table 1998-A. Summary of Expenditures by Source for Control Operations During 1998.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Ashepoo River	\$39,036	\$0	\$34,036	\$5,000	Colleton County
Back River Reservoir	\$120,070	\$31,272	\$54,062	\$34,736	CCPW/SCE&G/NWS
Bass Lake	\$295	\$148	\$148	\$0	-
Combahee River	\$902	\$451	\$171	\$280	Colleton County
Cooper River	\$18,054	\$9,027	\$3,430	\$5,597	Berkeley County
Goose Creek Reservoir	\$8,672	\$2,664	\$3,320	\$2,688	Berkeley County
Lake Keowee	\$1,224	\$612	\$233	\$379	Duke Power Co.
Little Pee Dee River	\$17,989	\$4,896	\$7,517	\$5,577	Marion/Horry Counties
Santee Coastal Reserve	\$27,717	\$0	\$18,750	\$8,967	SC Dept. of Natural Res.
Waccamaw River	\$466	\$0	\$322	\$144	Horry County
Fountain Lake	\$2,593	\$1,296	\$493	\$804	Santee Cooper
Lake Marion	\$27,079	\$13,539	\$5,145	\$8,394	Santee Cooper
Lake Moultrie	\$2,666	\$1,333	\$507	\$826	Santee Cooper
Huntington Beach State Pk	\$1,289	\$644	\$245	\$399	SC Parks, Rec, Tourism
Kings Mt State Park (Crawford Lake)	\$1,440	\$720	\$274	\$446	SC Parks, Rec, Tourism
Old Santee Canal State Pk	\$3,088	\$1,544	\$587	\$957	SC Parks, Rec, Tourism
Charles Town Landing St Pk (Swimming Lake)	\$646	\$323	\$123	\$200	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$6,462	\$3,231	\$1,229	\$2,002	
<i>Non Santee Cooper Total</i>	\$234,424	\$49,070	\$121,989	\$63,368	\$49,070
<i>Santee Cooper Total†</i>	\$32,337	\$16,168	\$6,145	\$10,024	
GRAND TOTAL	\$273,223	\$68,469	\$129,363	\$75,394	

† Total does not include fringe and overhead, nor 550 acres of water hyacinth treated on Lake Marion in November and 190 acres of other treatments not cost shared through the State Program.

Table 1998-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 1998.								
Water Body	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Effectiveness
Ashepool River	Water hyacinths	503.0	\$39,035.62	\$77.61	Reward	0.5 gal/ac	Reduce water hyacinths in main river and access areas.	85% control of areas treated in main river; hyacinths in most ricefields could not be treated.
Back River Reservoir	Fanwort	40.0	\$20,339.20	\$508.48	Hydrothol 191	240 lbs/ac	Reduce problems plants to maintain public	Cabomba, 65% control with regrowth of hydrilla in
	Hydrilla	220.0	\$48,468.20	\$220.31	Komeen	1 ppm	access and use; concentrate at boats ramps	6 weeks; hydrilla about 80% control with Komeen and
		30.0	\$31,645.54	\$1,054.85	Sonar AS	1/qt/ac	and water intakes.	40% control with Sonar at year end; water primrose
	Water hyacinth	105.0	\$8,149.05	\$77.61	Reward	0.5 gal/ac		about 85% control; water hyacinth 90% control.
	Water primrose	89.0	\$11,467.62	\$128.85	Rodeo	7.5 pt/ac		
Total		484.0	\$120,069.61	\$248.08				
Bass Lake	Salvinia	3.0	\$295.26	\$98.42	Reward	0.75 gal/ac	Eliminate Salvinia from pond.	90% control.
Combahee River	Alligatorweed, frogsbit	7.0	\$901.95	\$128.85	Rodeo	7.5 pt/ac	Provide public access for fishing and canoeing.	75% control of area treated.
Cooper River	Water hyacinths	221.0	\$17,151.81	\$77.61	Reward	0.5 gal/ac	Reduce water hyacinths throughout main river and	85% control of areas treated throughout year.
	Water primrose	7.0	\$901.95	\$128.85	Rodeo	7.5 gal/ac	public ricefields to greatest extent possible.	
Total		228.0	\$18,053.76	\$79.18				
Goose Creek Reservoir	Water hyacinths	105.0	\$8,543.39	\$81.37	Reward	0.5 gal/ac	Reduce nuisance plants to maintain use of water	Hydrilla and pondweed 100% control by grass carp stocked
	Water primrose	1	\$128.85	\$128.85	Rodeo	7.5 gal/ac	intakes, public recreation, access and use, and	in 1995; water hyacinth, 95% control after two
Total		106.0	\$8,672.24	\$81.81			encourage water flow.	treatments; water primrose 75% control.
Lake Keowee	Hydrilla	10.0	\$1,223.90	\$122.39	Komeen	1 ppm	Reduce or remove hydrilla in all areas.	95% control at end of season.
Little Pee Dee River	Alligatorweed, smartweed	136.0	\$17,523.60	\$128.85	Rodeo	7.5 pt/ac	Provide access to main river, tributaries, and "lakes".	75% control at end of season.
	Pennywort	6.0	\$465.63	\$77.61	Reward	0.5 gal/ac		
		142.0	\$17,989.23					
Santee Coastal Reserve	Phragmites	125.0	\$27,717.00	\$221.74	Rodeo	7.5 pt/ac	Reduce Phragmites to greatest extent possible.	85% control at end of season.
Waccamaw River	Water hyacinths	6.0	\$465.66	\$77.61	Reward	0.5 gal/ac	Reduce water hyacinths to greatest extent possible.	95% control at end of season.
Santee Cooper Lakes								
Fountain Lake	Hydrilla	40.0	\$2,592.50	\$64.81	Triploid Grass Carp	15/ac (610)	Reduce or remove hydrilla in all areas.	Results unknown.
Lake Marion	Alligatorweed, cutgrass, water primrose	80.0	\$ 11,276.91	\$140.96	Arsenal	0.5 gal/ac	Provide public access to open water areas and maintain hydropower generation.	Hydrilla, grass carp provided wide spread control; 85-90% control of other target plants from herbicides.
	Hydrilla	4.0	\$ 1,100.90	\$275.23	Reward + Komeen	2 gal +4 gal/ac		
	Lyngbya	27.0	\$ 7,870.96	\$291.52	Hydrothol 191	100 lbs/ac		
					Reward + K Tea	2 gal +4 gal/ac		
	Pondweed, coontail, fanwort	37.0	\$ 6,829.75	\$184.59	Sonar SRP	10 lbs/ac		
Total		148.0	\$ 27,078.52	\$182.96				
Lake Moultrie	Alligatorweed, cutgrass, water primrose	17.5	\$ 1,875.60	\$107.18	Arsenal	0.5 gal/ac	Provide public access to open water areas and maintain hydropower generation.	Hydrilla, grass carp provided wide spread control; 85-90% control of other target plants from herbicides.
	Pondweed, fanwort, coontail	4.0	\$ 790.43	\$197.61	Sonar SRP	10 lbs/ac		
Total		21.5	\$ 2,666.03	\$124.00				
State Park Lakes								
Huntington Beach State Pk	Cattails	10.0	\$1,288.50	\$128.85	Rodeo	7.5 pt/ac	Remove cattails to improve water quality	75% control at end of year.
Kings Mt State Park (Crawford Lake)	Slender naiad, pondweed	8.0	\$1,439.60	\$179.95	Aquathol K	4 gal/ac	Provide public access for swimming and boating.	60% control after 3 months.
Old Santee Canal State Pk	Alligatorweed, water primrose	10.0	\$1,288.50	\$128.85	Rodeo	7.5 pt/ac	Provide access for canoeing and improve water quality.	75% control of all species.
	Hydrilla, coontail	10.0	\$1,799.50	\$179.95	Aquathol K	4 gal/ac		
	Total	20.0	\$3,088.00	\$154.40				
Charles Towne Landing St (Swimming Lake)	Duckweed	5.0	\$388.05	\$77.61	Reward	0.5 gal/ac	Provide public access for fishing.	85% control of all species.
	Alligatorweed, pennywort	2.0	\$257.70	\$128.85	Rodeo	7.5 pt/ac		
Total		7.0	\$645.75	\$92.25				
State Park Lakes		45.0	\$ 6,461.85	\$143.60				
Non-Santee Cooper		1,653.0	\$ 240,886.08	\$145.73				
Santee Cooper		209.5	\$32,337.05	\$154.35				
GRAND TOTAL		1,862.5	\$273,223.13	\$146.70				

Table 1999-A. Summary of Expenditures by Source for Control Operations During 1999.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Ashepoo River	\$19,542	\$7,954	\$8,551	\$3,036	Colleton County
Back River Reservoir	\$121,814	\$21,814	\$61,021	\$38,979	CCPW/SCE&G/NWS
Baruch Waterway	\$4,559	\$2,280	\$2,280	\$0	-
Combahee River	\$1,345	\$673	\$673	\$0	Colleton County
Cooper River	\$50,891	\$18,476	\$17,444	\$14,970	Berkeley County
Goose Creek Reservoir	\$11,545	\$1,937	\$5,127	\$4,481	Charleston CPW
Jumper Pond	\$565	\$283	\$283	\$0	-
Lake Greenwood	\$1,868	\$0	\$934	\$934	Duke Power Co.
Lake Marion	\$92,339	\$5,109	\$2,043	\$85,188	Santee Cooper
Lake Moultrie	\$7,187	\$663	\$265	\$6,259	Santee Cooper
Potato Creek Impoundment	\$12,077	\$3,637	\$1,455	\$6,985	Santee Cooper
Taw Caw Cr. Impoundment	\$7,871	\$3,935	\$1,574	\$2,361	Santee Cooper
Lake Murray	\$34,630	\$0	\$17,315	\$17,315	SCE&G
Lake Prestwood	\$15,000	\$0	\$7,500	\$7,500	Sonoco Products
Little Pee Dee River	\$10,628	\$5,314	\$2,126	\$3,188	Marion/Horry Counties
Santee Coastal Reserve	\$59,408	\$24,557	\$24,557	\$10,295	SC Dept. of Natural Res.
Waccamaw River	\$646	\$323	\$129	\$194	Horry County
Charles Towne Landing St Pk	\$485	\$0	\$242	\$243	SC Parks, Rec, Tourism
Huntington Beach State Pk	\$673	\$336	\$168	\$168	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$1,157	\$336	\$410	\$411	
<i>Non Santee Cooper Total</i>	\$333,598	\$83,946	\$148,349	\$101,304	
<i>Santee Cooper Total</i>	\$119,474	\$13,344	\$5,338	\$100,792	
GRAND TOTAL	\$453,071	\$97,290	\$153,687	\$202,096	

Table 1999-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 1999.								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Effectiveness
Ashepoo River	Water hyacinths	242.0	\$19,541.50	\$80.75	Reward	0.5gal/ac	Reduce water hyacinths in main river and access areas.	80% control of areas treated in main river; 75% control in ricefields.
Back River Reservoir	Cabomba	40.0	\$22,320.00	\$558.00	Hydrothol 191	16 gal/ac	Reduce problem plants to maintain public access and use; concentrate at boat ramps and water intakes.	Cabomba, 75% control for 6 weeks with very little regrowth; 45% control of hydrilla treated with Komeen; 90% control of hydrilla treated with Sonar
	Hydrilla	122.5	\$28,567.00	\$233.20	Komeen	7.5 pt/ac		
		75.0	\$36,613.80	\$488.18	Sonar AS & K-Tea	1qt/ac + 2gal/ac		
	Water hyacinths	195.0	\$15,746.25	\$80.75	Reward	16 gal/ac		at years end; 80% control of water
	Water primrose	158.0	\$18,566.74	\$117.51	Rodeo	0.5 gal/ac		primrose; 85% control of water
TOTAL:		590.5	\$121,813.79	\$206.29				hyacinths.
Baruch Waterway	Phragmites	20.0	\$4,559.00	\$227.95	Rodeo	7.5 pt/ac	Reduce phragmites to greatest extent possible.	80% control after 6 weeks.
Combahee River	Alligatorweed, Frogsbit	10.0	\$1,345.30	\$134.53	Rodeo	7.5 pt/ac	Provide public access for fishing.	70% control with one treatment.
Cooper River	Hydrilla	97.5	\$22,737.00	\$233.20	Komeen	16 gal/ac	Reduce water hyacinths to greatest extent possible; provide boat trails to main channel through hydrilla.	75% control of water hyacinths; 70% control of water primrose; and 60% control of hydrilla.
	Water hyacinths	307.0	\$24,790.25	\$80.75	Reward	0.5 gal/ac		
	Water primrose	25.0	\$3,363.25	\$134.53	Rodeo	7.5 pt/ac		
	TOTAL:	429.5	\$50,890.50	\$118.49				
Goose Creek Reservoir	Water primrose	48.0	\$6,457.44	\$134.53	Rodeo	7.5 pt/ac	Reduce problem plants to maintain use of water intake; maintain public access and use, and flood flow.	90% control of water hyacinths
	Water hyacinths	63.0	\$5,087.25	\$80.75	Reward	0.5 gal/ac		75%control of water primrose.At end
	TOTAL:	111.0	\$11,544.69	\$104.01				
Jumper Pond	Water hyacinths	7.0	\$565.25	\$80.75	Reward	0.5 gal/ac	Eliminate all water hyacinth.	80% control of original acres.
Lake Greenwood	Slender naiad	10.8	\$1,868.40	\$173.00	Aquathol K	3.5 gal/ac	Reduce problems plants in areas of greatest public use.	90% control of areas treated.
Lake Marion	American lotus, waterlily	3.0	\$451.04	\$150.35			Provide public access and use of open water areas and maintain hydropower generation.	90-100% control of most target species at end of season; water primrose needed
	Cabomba	15.4	\$3,856.23	\$250.40	Sonar SRP	10 lbs/acre		retreatment due to submerged leaves
	Coontail	53.0	\$12,739.04	\$240.36	Aquathol K	5 gal/acre		during first treatment; Lyngbya control
	Giant cutgrass	13.5	\$2,349.04	\$174.00	Arsenal EUP	.375 gal/acre		was less than 55% at end of season.
	Hydrilla	8.2	\$2,112.42	\$257.61	Aquathol K	5 gal/acre		
	Lyngbya	51.8	\$13,155.69	\$253.97	Reward	2 gal/acre		
	Water hyacinth	684.3	\$54,000.07	\$78.91	Reward	.5 gal/acre		
	Water primrose,	24.0	\$3,675.92	\$153.16	Arsenal EUP	.25 gal/acre		
	alligatorweed, maidencane							
	TOTAL:	853.2	\$92,339.45	\$108.23				
Lake Moutrie	American lotus	0.5	\$168.90	\$337.80	Reward	1 gal/acre	Provide public access and use of open water areas and maintain hydropower generation.	80-100% control of target species at end
	Bladderwort	5.0	\$634.99	\$127.00	Reward	1 gal/acre		of season; retreatment of bladderwort
	Cabomba, hydrilla, water-	22.4	\$4,742.77	\$211.73	Sonar SRP	10 lbs/acre		and water primrose needed.
	milfoil, watershield							
	Lyngbya, pithophora	1.0	\$202.96	\$202.96	K-Tea	6 gal/acre		
	Water primrose,	10.8	\$1,437.37	\$133.09	Arsenal EUP	.25 gal/acre		
TOTAL:	alligatorweed, cutgrass	39.7	\$7,186.99	\$181.03				
Potato Creek Impoundment	Hydrilla	50.0	\$12,076.57	\$241.53	Aquathol K	5 gal/acre	Reduce hydrilla to the greatest extent possible.	90% control of treated areas at year end.
Taw Creek Impoundment	Cabomba	2.0	\$544.29	\$272.15	Sonar SRP (3)*	10 lbs/acre	Reduce nuisance plant populations to provide public access and use.	90-100% control of target species at end
	Coontail	21.0	\$5,054.80	\$240.70	Aquathol K	5 gal/acre		of season; retreatment of water primrose
	Hydrilla	2.0	\$616.68	\$308.34	Sonar SRP (3)*	10 lbs/acre		needed due to submerged leaves
	Water primrose	14.0	\$1,654.79	\$118.20	Arsenal EUP	.25 gal/acre		during first treatment.
	TOTAL:	39.0	\$7,870.56	\$201.81				
Lake Murray	Hydrilla	148.5	\$34,630.20	\$233.20	Komeen	16 gal/ac	Reduce or remove hydrilla in all areas affecting public access and use.	80% control after four weeks.
Lake Prestwood	Milfoil, bladderwort	300.0	\$15,000.00	\$50.00	Triploid Grass Carp	10/veg. ac (3000)	Reduce nuisance plants for access.	Too soon to tell.
Little Pee Dee River	Alligatorweed	79.0	\$10,627.87	\$134.53	Rodeo	7.5 pt/ac	Provide access to main river and lakes.	85% control at end of season.
Santee Coastal Reserve	Phragmites	310.0	\$59,408.00	\$191.64	Rodeo	7.5 pt/ac	Eliminate phragmites.	Determine after spring survey.
Waccamaw River	Water hyacinth	8.0	\$646.00	\$80.75	Reward	0.5 gal/ac	Eliminate water hyacinths.	95% control after 6 weeks; local flooding may increase acres next year.
State Park Lakes								
Charles Towne Landing State Park	Duckweed	6.0	\$484.50	\$80.75	Reward	0.5 gal/ac	Provide public access for fishing.	50% control because of thickness.
Huntington Beach State Park	Cattails	5.0	\$672.65	\$134.53	Rodeo	7.5 pt/ac	Remove cattails to improve water quality.	65% control at end of season.
State Park Lakes		11.0	\$1,157.15	\$105.20				
Santee Cooper Lakes		981.9	\$119,473.57	\$121.68				
GRAND TOTAL:		3259.2	\$453,071.22	\$139.01				

Table 2000-A . Summary of Expenditures by Source for Control Operations During 2000.

Water Body Name	Total Cost	State	Local	Local Sponsor
Back River Reservoir	\$89,960	\$45,747	\$44,212	CCPW/SCE&G/NWS
Cooper River	\$14,196	\$4,259	\$9,937	Berkeley County
Cromer Road Pond	\$118	\$118	\$0	-
Goose Creek Reservoir	\$7,570	\$5,299	\$2,271	Charleston CPW
Jumper Pond	\$79	\$79	\$0	-
Lake Greenwood	\$71,465	\$53,909	\$17,555	Duke Power/ Greenwd Co.
Lake Marion	\$110,299	\$13,351	\$96,948	Santee Cooper
Lake Moultrie	\$5,739	\$2,933	\$2,806	Santee Cooper
Potato Cr. Impoundment	\$7,301	\$1,752	\$5,549	Santee Cooper
Taw Caw Cr. Impoundment	\$9,145	\$4,555	\$4,590	Santee Cooper
Lake Murray	\$136,215	\$1,215	\$135,000	SCE&G
Lake Wateree	\$752	\$288	\$464	Duke Power Co.
Pee Dee River	\$7,021	\$3,165	\$3,856	Georgetown County
Waccamaw River	\$912	\$368	\$544	Georgetown County
Lake Warren	\$3,019	\$1,509	\$1,509	SCDNR Fisheries
John D. Long Lake	\$2,415	\$1,208	\$1,208	SCDNR Fisheries
Charles Towne Landing St Pk	\$1,737	\$0	\$1,737	SC Parks, Rec, Tourism
Huntington Beach State Pk	\$2,460	\$0	\$2,460	SC Parks, Rec, Tourism
Kings Mt. St. Pk.	\$2,096	\$0	\$2,096	SC Parks, Rec, Tourism
Lee State Pk.	\$911	\$0	\$911	SC Parks, Rec, Tourism
Little Pee Dee St. Pk.	\$9,828	\$6,880	\$2,948	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$17,033	\$6,880	\$10,153	
<i>Non Santee Cooper Total</i>	\$350,752	\$124,043	\$226,710	
<i>Santee Cooper Total</i>	\$132,484	\$22,591	\$109,893	
GRAND TOTAL	\$483,236	\$146,634	\$336,602	

Table 2000-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2000.								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Effectiveness
Back River Reservoir	Hydrilla	112.3	\$22,719.40	\$202.40	Komeen	16 gal/ac	Reduce problem plants to enhance public access, use, and water quality	80% control of hydrilla in with Sonar;
		61.0	\$24,156.00	\$396.00	Sonar AS & K-Tea	1qt/ac + 2gal/ac		60% initial control of hydrilla with Komeen
	Water hyacinth	13.0	\$1,142.60	\$87.89	Reward	0.5 gal/ac	and minimize floating islands and	with 100% regrowth after 6 wks; 75%
	Water primrose	406.0	\$41,941.60	\$103.30	Rodeo	7.5 pt/ac	impacts to water intakes.	control of water primrose and w. hyacinth
TOTAL		592.3	\$89,959.60	\$151.89				with fall regrowth due to funding loss.
Cooper River	Hydrilla	60.0	\$12,144.00	\$202.40	Komeen	16 gal/ac	Reduce water hyacinth to greatest extent possible; provide boat trails	80% control of water primrose; 75%
	Water primrose	20.0	\$2,052.00	\$102.60	Rodeo	7.5 pt/ac	to main channel through hydrilla.	control of hydrilla; hyacinths not treated
TOTAL		80.0	\$14,196.00	\$177.45				due to funding loss.
Cromer Road Pond	Water hyacinth	1.5	\$117.75	\$78.50	Reward	0.5 gal/ac	Eliminate all water hyacinth.	90% control of remaining plants.
Goose Creek Reservoir	Water primrose	47.0	\$4,822.20	\$102.60	Rodeo	7.5 pt/ac	Reduce water hyacinth to greatest extent possible; reduce w. primrose	95% control of water primrose and water
	Water hyacinth	35.0	\$2,747.50	\$78.50	Reward	0.5 gal/ac	for public use and flood flow.	hyacinth; hydrilla still controlled by grass
TOTAL		82.0	\$7,569.70	\$92.31				carp.
Jumper Pond	Water hyacinth	1.0	\$78.50	\$78.50	Reward	0.5 gal/ac	Eliminate all water hyacinth.	90% control of remaining plants.
Lake Greenwood	Pithophora	572	\$63,210.23	\$110.51	K-Tea, Cutrine Plus, Clearigate		Minimize growth of algae in Reedy R. arm; reduce naiad along developed shoreline.	60% control of floating mats after 2 wks; treatment of bottom mats with pellets
	Slender naiad	41.5	\$8,254.34	\$199.14	Aquathol K	3.5 gal/ac		kept most algae from surfacing for 2 wks.;
TOTAL		613.5	\$71,464.57	\$116.50				90% control of naiads.
Lake Marion	American lotus, waterlily, watershield	12.5	\$2,995.16	\$239.61	Reward, Rodeo, and, Arsenal EUP	0.5 gal/ac, 7.5 pts/ac	Suppress hydrilla to minimize spread and impacts to water uses;	>90% control of all target species except
	Cabomba, watermilfoil	11.0	\$3,214.76	\$292.25	Sonar SRP and AS	10 lbs/ac, 0.2 gal/ac	reduce w. hyacinth to enhance boating, fishing, hunting and public access; red.	for algae and parrotfeather; >80% control of
	Giant cutgrass	39.5	\$5,322.37	\$134.74	Arsenal EUP	0.25-0.375 gal/ac	cutgrass to enhance waterfowl habitat;	parrotfeather; <55% control of Lyngbya and
	Hydrilla	2.8	\$893.18	\$318.99	Aquathol K, Sonar	10 gal/ac, 0.25 gal/ac	reduce other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	Pithophora at end of the season.
	Lyngbya, Pithophora	79.0	\$14,294.64	\$180.94	Clearigate, Nautique K-Tea, Reward	1 gal/ac, 0.5 gal/ac, 6 gal/ac, 2 gal/ac		
	Water Hyacinth	954.0	\$77,624.96	\$81.37	Reward	0.5 gal/ac		
	Water primrose, alligator-weed, maidencane	36.0	\$5,300.67	\$147.24	Arsenal EUP	0.25 gal/ac		
	Parrotfeather	5.0	\$653.42	\$130.68	Rodeo, Reward	0.75 gal/ac, 1 gal/ac		
TOTAL		1139.8	\$110,299.16	\$96.77				
Lake Moultrie	American lotus, waterlily	4.00	\$820.09	\$205.02	Reward	1 gal/ac	Suppress hydrilla to minimize spread and impacts to water uses;	>90% control of most target species at
	Bladderwort	3.00	\$880.79	\$293.60	Reward	1 gal/ac	reduce w. hyacinth to enhance boating, fishing, hunting and public access; red.	end of the season; retreatment needed
	Cabomba, hydrilla, watermilfoil, watershield	2.90	\$746.43	\$257.39	Sonar SRP	10 lbs/ac	other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	for bladderwort and some emergent
	Water primrose, alligator-weed, maidencane, cutgrass	26.00	\$3,291.70	\$126.60	Arsenal EUP	0.25 gal/ac		species; <80% control of watermilfoil.
TOTAL		35.9	\$5,739.01	\$159.86				
Potato Creek Impoundment	Hydrilla	29.0	\$7,301.03	\$251.76	Aquathol K	8-10 gal/ac	Suppress hydrilla growth to min. spread.	>90% control of hydrilla at end of season.
Taw Caw Cr. Impoundment	Coontail	29.0	\$6,272.55	\$216.29	Aquathol K	5 gal/ac	Reduce problem plants to enhance public access and use.	>90% control of all treated areas at end
	Lyngbya, Pithophora	4.0	\$333.94	\$83.49	K-Tea & Cutrine Plus	5-6 gal/ac		of the season.
	Water primrose, alligator-weed, cutgrass, cattail	20.0	\$2,538.23	\$126.91	Arsenal EUP, Rodeo	0.25 gal/ac, 0.75 gal/ac		
TOTAL		53.0	\$9,144.72	\$172.54				
Lake Murray	Hydrilla	673.0	\$136,214.60	\$202.40	Komeen	16 gal/ac	Reduce hydrilla to min. spread and imp. to public access, use, and water intakes.	70-98% control of hydrilla; treatment areas very limited due to funding loss.
Lake Wateree	Hydrilla	6.0	\$752.48	\$125.41	Aquathol K, Komeen	2.5 gal/ac, 5 gal/ac	Eliminate hydrilla from site.	>95% removal of biomass.
John D. Long Lake	Pondweeds, naiads	20.0	\$2,415.00	\$120.75	Triploid grass carp	20 fish/ac (400 fish)	Reduce problem plants to enhance fishing and boating.	90% control of problem plants.
Lake Warren	Braz. elodea, watermilfoil	25.0	\$3,018.75	\$120.75	Triploid grass carp	20 fish/ac (500 fish)	Reduce problem plants to enhance fishing and boating.	25% control of problem plants.
Pee Dee River	Water hyacinth	87.0	\$7,020.75	\$80.70	Reward	0.5-0.75 gal/ac	Reduce water hyacinths to greatest extent possible.	90% control of water hyacinth.
Waccamaw River	Water hyacinth	9.0	\$706.50	\$78.50	Reward	0.5 gal/ac	Reduce water hyacinths and	95% control of water hyacinth after 6 wks;

Table2000-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2000.								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Effectiveness
	Phragmites	2.0	\$205.20	\$102.60	Rodeo	7.5 pt/ac	Phragmites to greatest extent possible.	65% control of Phragmites.
TOTAL		11.0	\$911.70	\$82.88				
State Park Lakes								
Charles Towne Landing SP	Duckweed	5.0	\$1,363.75	\$272.75	Sonar AS	1 pt/ac	Provide public access for bank fishing	75% control of duckweed; 90% control
	Alligatorweed, cattail	2.0	\$373.50	\$186.75	Rodeo	7.5 pts/ac	and improve aesthetics.	of cattails and alligatorweed.
TOTAL		7.0	\$1,737.25	\$248.18				
Huntington Beach State Pk.	Cattails, Phragmites	15.0	\$2,460.30	\$164.02	Rodeo	7.5 pt/ac	Remove cattails to improve waterfowl	80-85% control target plants.
							use; public wildlife observation, fishing.	
Kings Mt. State Park	Slender naiad	8.0	\$2,096.38	\$262.05	Aquathol K	4 gal/ac	Reduce naiads in swimming and boating	70% control of target plants.
							areas.	
Lee State Park	Watermilfoil	2.0	\$911.10	\$455.55	2, 4-D granular	200 lbs/ac	Reduce watermilfoil to enhance fishing	90% control of target plants.
							and canoeing.	
Little Pee Dee State Park	Watermilfoil, cowlii	20.0	\$9,828.00	\$491.40	2, 4-D granular	200 lbs/ac	Reduce plants to enhance swimming,	75% control of lillies; 65% control of
							boating, and fishing.	watermilfoil.
State Park Lakes		52.0	\$17,033.03	\$327.56				
Santee Cooper Lakes		1257.7	\$132,483.92	\$105.34				
GRAND TOTAL:		3501.9	\$483,236.35	\$137.99				

Table 2001-A. Summary of Expenditures by Source for Control Operations During 2001.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Back River Reservoir	\$115,870	\$36,511	\$0	\$79,359	CCPW/SCE&G/NWS
Cooper River	\$11,468	\$5,734	\$0	\$5,734	Berkeley County
Cromer Road Pond	\$827	\$0	\$248	\$579	-
Goose Creek Reservoir	\$9,916	\$4,085	\$0	\$5,831	Charleston CPW
Lake Greenwood	\$14,755	\$0	\$0	\$14,755	Duke Power/ Greenwd Co.
Lake Marion	\$21,837	\$9,682	\$0	\$12,155	Santee Cooper
Lake Moultrie	\$14,582	\$5,957	\$0	\$8,624	Santee Cooper
Church Branch Impoundment	\$4,210	\$1,328	\$0	\$2,883	Santee Cooper
Dean Swamp Impoundment	\$12,804	\$5,184	\$0	\$7,620	Santee Cooper
Fountain Lake	\$2,695	\$1,003	\$0	\$1,692	Santee Cooper
Potato Cr. Impoundment	\$9,023	\$4,511	\$0	\$4,511	Santee Cooper
Taw Caw Cr. Impoundment	\$16,459	\$6,551	\$0	\$9,908	Santee Cooper
Lake Murray	\$245,969	\$122,984	\$0	\$122,984	SCE&G/Lexington Co.
Lake Wateree	\$147	\$0	\$0	\$147	Duke Power Co.
Little Pee Dee River	\$10,162	\$3,356	\$0	\$6,806	Horry & Marion County
Waccamaw River	\$203	\$0	\$102	\$101	Georgetown County
Lake Cherokee	0*	\$0	\$0	\$0	SCDNR Fisheries
Mountain Lake	0*	\$0	\$0	\$0	SCDNR Fisheries
Barnwell State Park	\$4,550	\$0	\$0	\$4,550	SC Parks, Rec, Tourism
Charles Towne Landing St Pk.	\$390	\$0	\$0	\$390	SC Parks, Rec, Tourism
Huntington Beach State Pk	\$1,950	\$0	\$0	\$1,950	SC Parks, Rec, Tourism
Kings Mt. State Park	\$1,260	\$0	\$0	\$1,260	SC Parks, Rec, Tourism
Little Pee Dee State Park	\$5,175	\$0	\$0	\$5,175	SC Parks, Rec, Tourism
Poinsette State Park	\$2,275	\$0	\$0	\$2,275	SC Parks, Rec, Tourism
Santee State Park	\$1,550	\$0	\$0	\$1,550	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$17,150	\$0	\$0	\$17,150	
<i>Non Santee Cooper Total</i>	\$426,466	\$172,670	\$350	\$253,446	
<i>Santee Cooper Total</i>	\$81,609	\$34,215	\$0	\$47,394	
GRAND TOTAL	\$508,075	\$206,885	\$350	\$300,840	

* received complimentary grass carp from Santee Cooper.

Table 2001-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2001.

Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Effectiveness
Back River Reservoir	Hydrilla	238.0	\$50,684.48	\$212.96	Komeen	16 gal/ac	Reduce problem plants to enhance public access, use, and water quality	30% control of hydrilla with Sonar & 75-90% control with Komeen after 6 wks.; 75% control of
	Water hyacinth	75.0	\$30,888.00	\$411.84	Sonar AS & K-Tea	1qt/ac + 2gal/ac	and minimize floating islands and	water primrose and w. hyacinth with Eagre; 85%
	Water primrose	275.0	\$28,011.22	\$101.86	Eagre	7.5 pt/ac	impacts to water intakes.	control of wat. primrose with Arsenal after 9wks.
TOTAL:		665.0	\$115,869.98	\$174.24				
Cooper River	Hydrilla	50.0	\$10,648.00	\$212.96	Komeen	16 gal/ac	Reduce water hyacinth to greatest extent possible; provide boat trails	80% control of water primrose after 8 wks; 65% control of hydrilla after 4 wks;
	Water primrose	8.0	\$819.52	\$102.44	Arsenal (EUP)	32 oz/ac	to main channel through hydrilla.	
TOTAL:		58.0	\$11,467.52	\$197.72				
Cromer Road Pond	Water hyacinth	8.5	\$826.54	\$97.24	Reward	0.5-0.75 gal/ac	Eliminate all water hyacinth.	85% control of treated plants.
Goose Creek Reservoir	Water primrose	43.0	\$4,364.07	\$101.49	Eagre	7.5 pt/ac	Reduce water hyacinth to greatest extent possible; reduce w. primrose	75% control of water primrose; 90% control of water hyacinth; hydrilla still controlled by grass carp.
	Water hyacinth	68.0	\$5,551.52	\$81.64	Reward	0.5 gal/ac	for public use and flood flow.	
TOTAL:		111.0	\$9,915.59	\$89.33				
Lake Greenwood	Pithophora	60.0	\$8,160.00	\$136.00	Citrine Plus	60 lbs/ac	Minimize growth of algae in Reedy R. arm; reduce naiad along developed shoreline.	95% control of Pithophora throughout year; 60% control of naiads.
	Slender naiad	44.0	\$6,595.16	\$149.89	Aquathol K	3.5 gal/ac		
TOTAL:		104.0	\$14,755.16	\$141.88				
Lake Marion	American lotus, waterlily, watershield	5.0	\$462.68	\$92.54	Reward, Eagre, and, Arsenal (EUP)	0.5 gal/ac	Manage hydrilla to minimize spread and impacts to water uses; reduc.	>90% control of all target species except for algae and parrotfeather; >80% control of parrotfeather; >85% control of Lyngbya and Pithophora at end of the season (low lake levels and freezing temps have reduced plant density).
	Giant cutgrass	28.8	\$3,619.66	\$125.68	Arsenal (EUP)	0.25-0.375 gal/ac	cutgrass to enhance waterfowl habitat;	
	Lyngbya, Pithophora	47.0	\$7,125.45	\$151.61	Clearigate, Nautique	1 gal/ac, 0.5 gal/ac,	reduce other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	
	Water primrose, alligator-weed, maidencane	59.2	\$6,880.29	\$116.22	Arsenal (EUP), Eagre, AquaNeat	0.25 gal/ac; 0.75 gal/ac		
	Parrotfeather	1.0	\$238.25	\$238.25	Rodeo, Reward	0.75 gal/ac, 1 gal/ac		
	Water hyacinth	32.0	\$3,510.27	\$109.70	Reward	0.5 gal/ac		
TOTAL:		173.0	\$21,836.60	\$126.22				
Lake Moultrie	American lotus, waterlily	13.5	\$1,468.83	\$108.80	Reward	1 gal/ac	Manage hydrilla to minimize spread and impacts to water uses; reduc.	>90% control of most target species at end of the season; retreatment needed for some emergent species.
	Cabomba, watermilfoil	4.5	\$1,042.15	\$231.59	Sonar SRP	10 lbs/ac	cutgrass to enhance waterfowl habitat;	
	Wat. prim., alligatorweed	86.0	\$9,016.38	\$104.84	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	reduce other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	
	Giant cutgrass, Cattail	22.5	\$2,583.75	\$114.83	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac		
	Bladderwort	1.0	\$267.43	\$267.43	Reward	1 gal/ac		
	Hydrilla	0.7	\$203.07	\$290.10	Reward/Komeen	2 gal/ac + 3.5 gal/ac		
TOTAL:		128.2	\$14,581.61	\$113.74				
Church Branch Impound.	Wat. primrose, alligatorwd, giant cutgrass, cattail	4.0	\$583.69	\$145.92	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	Reduce problem plants to enhance public access and use.	>90% control of target plants at end of season.
	Watermilfoil, parrotfeather	9.5	\$3,626.71	\$381.76	Sonar AS, 2, 4D BEE	0.2 gal/ac; 200 lbs/ac		
TOTAL:		13.5	\$4,210.40					
Dean Swamp Impound.	Wat. primrose, alligatorwd, giant cutgrass, cattail	15.5	\$1,757.58	\$113.39	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	Reduce problem plants to enhance public access and use.	>90% control of coontail and emerget plants and 65% control of Lyngbya at end of season.
	Coontail	12.0	\$3,087.23	\$257.27	Aquathol K	5 gal/ac		
	Lyngbya, Pithophora	26.5	\$7,958.95	\$300.34	K-Tea, Reward,	6 gal/ac; 2 gal/ac		
TOTAL:		54.0	\$12,803.76	\$237.11	Hydrothol 191	0.5 gal/ac		
Fountain Lake	Wat. primrose, alligatorwd, giant cutgrass, cattail	7.5	\$927.80	\$123.71	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	Reduce problem plants to enhance public access and use.	>90% control of target plants at end of season.
	American lotus, waterlily	6.0	\$1,767.37	\$294.56	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac		>90% control of target plants at end of season.
TOTAL:		13.5	\$2,695.17					
Potato Creek Impoundment	Hydrilla	30.0	\$9,022.81	\$300.76	Aquathol K, Hydrothol	5 gal/ac, 1 gal/ac	Reduce problem plants to enhance public access and use.	>80% control of target plants at end of season.
Taw Caw Cr. Impoundment	Coontail	53.0	\$12,909.76	\$243.58	Aquathol K	5 gal/ac	Reduce problem plants to enhance public access and use.	>90% control of target plants at end of season.
	Water primrose, alligator-weed, cutgrass, cattail	35.0	\$3,548.75	\$101.39	Arsenal EUP, Eagre	0.25 gal/ac, 0.75 gal/ac		
TOTAL:		88.0	\$16,458.51	\$187.03				
Lake Murray	Hydrilla	1155.0	\$245,968.80	\$212.96	Komeen	16 gal/ac	Reduce hydrilla to min. spread and imp. to public access, use, and water intakes.	70-99% control of hydrilla depending on depth and wind conditions.
Lake Wateree	Hydrilla	1.0	\$147.14	\$147.14	Komeen	10 gal/ac	Eliminate hydrilla from site.	>95% control, no regrowth.
Little Pee Dee River	Alligatorweed	100.0	\$10,162.30	\$101.62	Eagre, Arsenal (EUP)	0.75 gal/ac; 32 oz/ac	Reduce alligatorweed for boat access.	90% control with Eagre; 75 % control with Arsenal.

Table 2001-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2001.								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Effectiveness
Waccamaw River	Wat. hyacinth, wat. primrose, alligatorweed, Phragmites	2.0	\$202.98	\$101.49	Eagre	7.5 pt/ac	Reduce problem plants and Phragmites to greatest extent possible.	95% control of water hyacinth; 85% control of Phragmites.
Lake Cherokee	Slender spikerush, naiads	20.0	\$0.00	\$0.00	Triploid grass carp	20 fish/ac (400 fish)	Reduce problem plants to enhance fishing and boating.	Too soon for results.
Mountain Lake	Pondweeds	5.0	\$0.00	\$0.00	Triploid grass carp	20 fish/ac (100 fish)	Reduce problem plants to enhance fishing and boating.	Too soon for results.
State Park Lakes								
Barnwell State Park	Waterlily	10.0	\$4,550.00	\$455.00	2, 4-D granular	200 lbs/ac	Improve fishing and boating.	85-90% control of target plants.
Charles Towne Landing SP	Pennywort, alligatorweed	2.0	\$390.00	\$195.00	Rodeo	7.5 pt/ac	Provide public access for bank fishing	90-95% control of target plants.
Huntington Beach State Park	Cattails, Phragmites	10.0	\$1,950.00	\$195.00	Rodeo	7.5 pt/ac	Remove cattails to improve waterfowl use; public wildlife observation, fishing.	60-65% control target plants.
Kings Mt. State Park	Slender naiad	4.0	\$1,260.00	\$315.00	Aquathol K	4 gal/ac	Reduce naiads in swimming and boating areas.	80-85% control of target plants.
Little Pee Dee State Park	Watermilfoil, cowli	10.0	\$5,175.00	\$517.50	2, 4-D granular	200 lbs/ac	Reduce plants to enhance swimming, boating, and fishing.	75-80% control of target plants.
Poinsett State Park	Cowli	5.0	\$2,275.00	\$455.00	2, 4-D granular	200 lbs/ac	Improve swimming, fishing and boating.	80-85% control of target plants.
Santee State Park	Coontail	5.0	\$1,550.00	\$310.00	Reward	2 gal/ac	Improve fishing and boating.	85-90% control of target plants.
State Park Lakes		46.0	\$17,150.00	\$372.83				
Santee Cooper Lakes		499.2	\$81,608.86	\$163.48				
GRAND TOTAL:		2774.7	\$508,074.87	\$183.11				

Table 2002-A. Summary of Expenditures by Source for Control Operations During 2002.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Back River Reservoir	\$92,071	\$38,877	\$0	\$53,194	CCPW/SCE&G/NWS
Black Mingo Creek	\$1,223	\$611	\$0	\$611	Georgetown County
Combahee River	\$1,279	\$640	\$0	\$640	Colleton County
Cooper River	\$36,414	\$18,207	\$0	\$18,207	Berkeley County
Goose Creek Reservoir	\$21,194	\$10,597	\$0	\$10,597	Charleston CPW
Lake Greenwood	\$31,556	\$15,778	\$0	\$15,778	Duke Power/ Greenwd Co.
Pee Dee River	\$10,436	\$5,218	\$0	\$5,218	Georgetown County
Santee Coastal Reserv	\$47,717	\$0	\$0	\$47,717	SCDNR-WFF Div.
Waccamaw River	\$1,249	\$625	\$0	\$625	Georgetown County
Lake Marion	\$15,444	\$5,838	\$0	\$9,606	Santee Cooper
Lake Moultrie	\$7,060	\$2,765	\$0	\$4,295	Santee Cooper
Church Branch Impoun	\$9,563	\$4,300	\$0	\$5,263	Santee Cooper
Dean Swamp Impound	\$10,852	\$4,297	\$0	\$6,555	Santee Cooper
Fountain Lake	\$348	\$104	\$0	\$243	Santee Cooper
Taw Caw Cr. Impoundm	\$5,781	\$1,734	\$0	\$4,046	Santee Cooper
Barnwell State Park	\$3,250	\$0	\$0	\$3,250	SC Parks, Rec, Tourism
Kings Mt. State Park	\$1,800	\$0	\$0	\$1,800	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$5,050	\$0	\$0	\$5,050	
<i>Non Santee Cooper Tot</i>	\$248,190	\$90,553	\$0	\$157,637	
<i>Santee Cooper Total</i>	\$49,047	\$19,038	\$0	\$30,009	
GRAND TOTAL	\$297,236	\$109,591	\$0	\$187,646	

Table 2002-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2002								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objectives	Control Effectiveness
Back River Reservoir	Hydrilla	229.00	\$50,597.98	\$220.95	Komeen	16 gal/ac	Reduce problem plants to enhance public access, use, water quality,	85% control of hydrilla except Foster Creek which was 50% control
	Water hyacinth	459.00	\$38,220.93	\$83.27	Reward	0.5 gal/ac	and maintain electric power generation and minimize impacts to	90% control of water hyacinth
	Water primrose	40.00	\$3,251.60	\$81.29	Eagre	7.5 pt/ac	water intakes.	75% control of water primrose
	Total	728.00	\$92,070.51	\$126.47				
Black Mingo Creek	Alligatorweed	10.00	\$1,222.80	\$122.28	Arsenal (EUP), Eagre	24 oz/6 pt/ac	Reduce problem plants to enhance public access and use.	75% control of alligatorweed with some regrowth after 2 months
Combahee River	Alligatorweed	7.00	\$855.96	\$122.28	Arsenal (EUP), Eagre	24 oz/6 pt/ac	Provide public access for bank	95% control after three treatments
	Parrott feather, frog's bit	4.00	\$423.28	\$105.82	Reward	0.75 gal/ac	fishing	
	Total	11.00	\$1,279.24	\$116.29				
Cooper River	Hydrilla	25.00	\$5,430.50	\$217.22	Komeen	16 gal/ac	Provide boat trails to main channel through hydrilla.	70% control of hydrilla
	Water hyacinth	355.00	\$29,560.85	\$83.27	Reward	0.5 gal/ac	Reduce water hyacinth to greatest	90% control of water hyacinth
	Water primrose	1.00	\$122.28	\$122.28	Arsenal (EUP), Eagre	24 oz/6 pt/ac	extent possible. Reduce problem plants to	90% control of water primrose
	Water primrose	16.00	\$1,300.64	\$81.29	Eagre	7.5 pt/ac	enhance public access and use.	
	Total	397.00	\$36,414.27	\$91.72				
Goose Creek Reservoir	Water lettuce, water hyacinth	235.00	\$19,568.45	\$83.27	Reward	0.5 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.	90% control of water hyacinth
	Water primrose	20.00	\$1,625.80	\$81.29	Eagre	7.5 pt/ac	Reduce water primrose for public use and flood flow.	75% control of water primrose; hydrilla still controlled by grass carp.
	Total	255.00	\$21,194.25	\$83.11				
Lake Greenwood	Hydrilla	109.50	\$27,121.81	\$247.69	Aquathol K	5 gal/ac	Eradicate hydrilla from site.	99% control of hydrilla. Note: Eradication of hydrilla yet to be determined.
	Slender naiad	16.50	\$4,434.33	\$268.75	Aquathol K	5 gal/ac	Reduce naiad along developed shoreline.	85% control of Slender naiad
	Total	126.00	\$31,556.14	\$250.45				
Pee Dee River								
Thoroughfare Creek	Water hyacinth	72.00	\$5,995.44	\$83.27	Reward	0.5 gal/ac	Reduce water hyacinth to greatest	90% control of hyacinth
	Sandy Island	25.00	\$4,440.75	\$177.63	Reward	0.75 gal/ac	extent possible to enhance public access.	95% control of hyacinth with two retreatments
	Total	97.00	\$10,436.19	\$107.59				
Santee Coastal Reserve	Phragmites	299.00	\$47,717.41	\$159.59	Arsenal (EUP), Rodeo	24 oz/6 pt/ac	Reduce phragmites to enhance waterfowl habitat, public access and use.	90% control of phragmites
Waccamaw River	Water hyacinth	15.00	\$1,249.05	\$83.27	Reward	0.75 gal/ac	Reduce water hyacinth to greatest extent possible to enhance public access.	90% control of water hyacinth
Santee Cooper Lakes								
Lake Marion	American lotus, waterlily, watershield	1.00	\$174.83	\$174.83	Reward, Glyphosate	.5 gal/ac, .75 gal/ac	Reduce problem plant species in priority use areas to enhance public	>90% control of plant in areas treated.
	Giant cutgrass	50.50	\$7,255.61	\$143.68	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	access and use, enhance waterfowl habitat, and to maintain electric	>95% control of plant in areas treated.
	Lyngbya, Pithophora	18.00	\$2,541.55	\$141.20	K-Tea, Reward	6.0 gal/ac, 2.0 gal/ac	power generation.	65% control of plant in areas treated.
	Water hyacinth	14.50	\$1,364.90	\$94.13	Reward	.5 gal/ac		>95% control of plant in areas treated.
	Water primrose, Alligatorweed	29.00	\$4,014.22	\$138.42	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac		>85% control of plant in areas treated.
	Water pod, water willow, Slender naiad, pondweed	0.25	\$92.55	\$370.20	Reward, Komeen	2.0 gal/ac, 4.0 gal/ac		>90% control of plant in areas treated.
	Total	113.25	\$15,443.66	\$136.37				
Lake Moultrie	American lotus, waterlily, watershield	36.50	\$3,688.61	\$101.06	Glyphosate	.75 gal/ac.	Reduce problem plant species in priority use areas to enhance public	>90% control of plant in areas treated.
	Bladderwort, pondweed	1.25	\$357.04	\$285.63	Reward	2 gal/ac	access and use, enhance waterfowl habitat, and to maintain electric	>90% control of plant in areas treated.
	Hydrilla	0.50	\$162.51	\$325.02	Komeen / Reward	4.0 / 2.0 gal/ac	power generation.	>90% control of plant in areas treated.
	Water primrose, Alligatorweed	11.25	\$1,606.54	\$142.80	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac		>85% control of plant in areas treated.
	Giant cutgrass, cattail	11.25	\$1,245.20	\$110.68	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac		>95% control of plant in areas treated.
	Total	60.75	\$7,059.90	\$116.21				

Table 2002-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2002								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objectives	Control Effectiveness
Church Branch Impoundment	Water primrose, Alligatorweed	2.50	\$317.35	\$126.94	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac,.50 - .75 gal/ac	Reduce problem plant species to enhance public access and use and	>85% control of plant in areas treated.
	Giant cutgrass, cattail	1.00	\$126.94	\$126.94	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac,.50 - .75 gal/ac	to enhance waterfowl habitat.	>90% control of plant in areas treated.
	Lyngbya, Pithophora	2.00	\$251.91	\$125.96	K-Tea, Reward, Hydrothol 191 Granular & Liquid	6 gal/ac, 2 gal/ac, .5 gal/ac & 100 lbs/ac		>90% control of plant in areas treated.
	Water milfoil, parrot feather	7.75	\$3,037.74	\$391.97	2,4-D Granular	150 - 200 lbs/ac		>95% control of plant in areas treated.
	Coontail	1.25	\$629.67	\$503.74	Reward	2.0 gal/ac		>90% control of plant in areas treated.
	Pondweed	16.00	\$4,888.83	\$305.55	Aquathol K Liquid	6.0 gal/ac		>90% control of plant in areas treated.
	Slender naiad	1.00	\$310.43	\$310.43	Aquathol K Liquid	6.0 gal/ac		>80% control of plant in areas treated.
Total		31.50	\$9,562.87	\$303.58				
Dean Swamp	Hydrilla	26.50	\$7,657.66	\$288.97	Aquathol K, Hydrothol 191 Liquid, Reward, Komeen	6.0 gal/ac, .50 gal/ac, 2.0 gal/ac, 4.0 gal/ac	Reduce problem plant population to improve recreational access	75% control of areas treated.
	Coontail	2.00	\$581.91	\$290.96	Aquathol K	5 gal/ac		>80% control of plant in areas treated.
	Water primrose, Alligatorweed	3.00	\$281.28	\$93.76	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac,.50 - .75 gal/ac		>85% control of plant in areas treated.
	Lyngbya, Pithophora	12.00	\$2,331.21	\$194.27	Hydrothol 191 Liquid / Granular, Reward, K-Tea	.5 - 1.0 gal / 60-80 lb/ac, 2.0 gal/ac, 6.0 gal/ac		65% control of plant in areas treated.
Total		43.50	\$10,852.06	\$249.47				
Fountain Lake	Water primrose, Alligatorweed	2.00	\$173.76	\$86.88	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac,.50 - .75 gal/ac	Reduce problem plant population to improve recreational access	>85% control of plant in areas treated.
	American lotus, fragrant waterlily, watershield	2.00	\$173.76	\$86.88	Glyphosate	.75 gal/ac		>90% control of plant in areas treated.
Total		4.00	\$347.52	\$86.88				
Taw Caw Impoundment	Coontail	10.00	\$2,590.95	\$259.10	Aquathol K	5 gal/ac	Reduce problem plant population to improve recreational access	>80% control of plant in areas treated.
	Bladderwort, slender naiad	2.00	\$518.20	\$259.10	Aquathol K	5 gal/ac		>80% control of plant in areas treated.
	Giant cutgrass, cattail	2.00	\$241.48	\$120.74	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac,.50 - .75 gal/ac		>95% control of plant in areas treated.
	Water primrose, Alligatorweed,	20.00	\$2,429.95	\$121.50	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac,.50 - .75 gal/ac		>85% control of plant in areas treated.
Total		34.00	\$5,780.58	\$170.02				
Barnwell State Park - Swimming Lake	Waterlily	10.00	\$3,250.00	\$325.00	2,4-D granular	200 lb/ac	Reduce problem plant population to improve recreational access	85% control of waterlily
King's Mt. State Park - Lake Crawford	Slender naiad	4.00	\$1,800.00	\$450.00	Aquathol K	4.0 gal/ac	Reduce problem plant population to improve recreational access	75% control of slender naiad
Total		14.00	\$5,050.00	\$360.71				
SCDNR Total		1938.00	\$243,139.86	\$125.46				
Santee Cooper Total		287.00	\$49,046.59	\$170.89				
State Park Lakes Total		14.00	\$5,050.00	\$360.71				
Grand Total		2239.00	\$297,236.45	\$132.75				

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